DOCUMENT RESUME

ED 253 302 PS 014 788

TITLE	The State of the World's Children, 1984.
INSTITUTION	United Nations Children's Fund, New York, N.Y.
REPORT NO	ISBN-0-19-828489-6
PUB DATE	83
NOTE	207p.; Expanded version of ED 241 128.
AVAILABLE FROM	Oxford University Press, Humanities and Social Sciences, 200 Madison Avenue, New York, NY 10016 (Hardcover, $19.95).
PUB TYPE	Information Analyses (070) -- Books (010) -- Statistical Data (110)
EDRS PRICE	MF01/PC09 Plus Postage.
DESCRIPTORS	*Children; Demography; *Developing Nations; Family Planning; Foreign Countries; Health Education; Immunization Programs; Infant Mortality; Intervention; Mothers; Nutrition; *Physical Development; *Physical Health; Statistical Data
IDENTIFIERS	Breastfeeding; Child Growth Charts; Food Supplements; Oral Rehydration Therapy; Recession; *UNICEF

ABSTRACT

Expanding on information provided in a softcover report of the same title, this hardcover edition contains additional chapters and presents a more complete picture of the revolution in child survival that UNICEF now believes to be possible. Part I, the annual message from the executive director of UNICEF, summarizes worldwide reaction to breakthroughs in knowledge and technique that now make it possible to improve the health of millions of children. Throughout this part, 26 inset panels describe successful efforts to improve children's health. Part II brings together six essays by medical authorities. These essays outline both the potential for and problems in using oral rehydration therapy, growth monitoring, breastfeeding, expanded immunization, family spacing, and food supplements for pregnant and lactating women and infants who are being weaned. In Part III, three novelists from the developing world write about their visits to countries where changes are being made to improve health and living conditions. Part IV reports a special UNICEF study of the impact of the current world recession on the world's children. Part V presents, in tabular form, economic and social statistics on all the nations of the world, with particular reference being made to children's well-being. These tables include data on the pattern of child deaths and information for 130 nations on basic child welfare indicators, nutrition, health, education, demographic indicators, and economic indicators. (CB)

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THE STATE OF THE WORLD'S CHILDREN 1984

PS 014788

United Nations Children's Fund
(UNICEF)

From *The Lancet*, leading British medical journal, May, 1983

'This year's State of the World's Children *report evoked a world-wide response. Commented on by many of the nations' leaders and reviewed in over 2000 newspapers, the report focuses on UNICEF's belief that a Child Health Revolution is now possible.*

While UNICEF's emphasis remains on primary health care, additional and special emphasis is now being given to oral rehydration therapy, immunization, breastfeeding, with birth spacing and growth monitoring, and the introduction of suitable weaning foods.

If governments can be encouraged to create this child health revolution, a real opportunity arises to save the lives of millions of children and to help them grow up healthier and happier.

UNICEF rightly believes that a child health revolution may be the type of inspiration that the world needs'

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THE STATE OF THE WORLD'S CHILDREN 1984

James P. Grant
Executive Director of the
United Nations Children's Fund
(UNICEF)

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PUBLISHED FOR UNICEF
Oxford University Press

Oxford University Press, Walton Street, Oxford OX2 6DP
London Glasgow New York Toronto
Delhi Bombay Calcutta Madras Karachi
Kuala Lumpur Singapore Hong Kong Tokyo
Nairobi Dar es Salaam Cape Town
Melbourne Auckland
and associates in
Beirut Berlin Ibadan Mexico City Nicosia

Oxford is a trade mark of Oxford University Press

Published in the United States by Oxford University Press, New York

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British Library Cataloguing in Publication Data
The state of the world's children.—1983–4
1. Children-Care and hygiene
613' 0432'05 RJ101
ISBN 0–19–828489–6 Cloth
ISBN 0–19–828478–0 paperback

UNICEF, 866 U.N. Plaza, New York, N.Y. 10017 U.S.A.
UNICEF Palais des Nations, CH1211–Geneva 10–Switzerland.

Cover and design: Miller, Craig and Cocking, Woodstock, U.K.
Charts and tables: Stephen Hawkins, Oxford Illustrators, Oxford, U.K.
Typesetting and Printing: Burgess & Son (Abingdon) Ltd, U.K.

Edited and produced for UNICEF by P & L Adamson

Introduction

Following its launch in Brussels towards the end of 1983, "The State of the World's Children" report has been the subject of world-wide attention through the print and electronic media of almost every nation. Its central message is that a very considerable improvement in the well-being of the world's children could now be achieved within a relatively short time and at a relatively low cost.

This hardcover edition of "The State of the World's Children 1984" contains additional chapters and presents a more complete picture of the revolution in child survival which UNICEF now believes to be possible.

Part I is the annual "State of the World's Children" message for 1984 from the Executive Director of UNICEF, James P Grant. This year, the message summarises the world-wide reaction to the breakthroughs in knowledge and technique which make it possible to save the lives of many millions of children each year and to protect the health of many millions more. The report goes on to argue the need for the social and political breakthroughs which are equally necessary if this potential is to be fulfilled. Throughout Part I, inset panels draw together the mounting evidence from around the world to show that these relatively simple and inexpensive techniques can indeed add up to a revolution in child survival.

Part II brings together six essays by distinguished medical authorities describing in more detail the main breakthroughs of recent years and outlining both the potential and the problems of putting them into practice on the necessary scale.

Part III looks at the challenge of the child survival revolution from a very different angle. The story of the present potential for a change in the "State of the World's Children" is not just the story of technical breakthroughs, it is also the story of a struggle to improve the human condition. To record that struggle, three distinguished novelists from the developing world write about their visits to countries and regions where this change in the lives of children may now be beginning.

Part IV is a UNICEF special study of the impact of the current world recession on the world's children. Drawing on the assistance of an international panel of economists the study argues that the children of the world's poorest families are suffering disproportionately from the effects of economic downturn. With a national and international effort to shield young children from recession, and with wide-spread use of the low cost techniques now available, progress for the world's children could be maintained—and even accelerated—despite economic dark times.

Part V sets out economic and social statistics on all the nations of the world with particular reference to children's well-being. In keeping with the message of the "State of the World's Children", the statistical tables list the nations of the world not in order of their wealth but in order of their infant mortality rates.

CONTENTS

I The State of the World's Children 1984

James P. Grant, Executive Director of the United Nations Children's Fund (UNICEF).

A Revolution for Children 1

The Challenge 5
Recession 9
'Waiting for development' 10
The new road 15
The sinister alliance 20

The Cutting Edge 25
Growth monitoring 25
Breastfeeding 27
Oral rehydration therapy 31
Expanded immunization 41
Synergisms 45

The Mother of Change 49
Food supplements 49
Family spacing 53
Female education 57
Slowing population growth 60

Inner Development 65

II Lifelines

Essays on the Children's Revolution

Oral rehydration therapy 72
Growth monitoring 77
The promotion of breastfeeding 82
Expanded immunization 86
Family spacing 92
Food supplements 101

III Ideas in Action

Distinguished novelists from Africa, Asia, and Latin America record their personal experiences of the children's revolution in action.

Being
from Eduardo Galeano in Nicaragua 106
Chizuva
from Charles Mungoshi in Zimbabwe 113
In Manggis
from Anita Desai in Indonesia 126

IV The Impact of World Recession on Children

A special study by UNICEF's own staff with contributions from an international panel of economists

Introduction 138

The Extent and Depth of World Recession
The Differing Impact: 139

AFRICA 144
Zambia 146
Tanzania 147
Nigeria 148

ASIA 149
India 150
Sri Lanka 151
The Republic of Korea 154

LATIN AMERICA 155
THE INDUSTRIALISED COUNTRIES 159

An Overview of the Impact 161
Conclusions for Action 167

V Statistics

Economic and Social Statistics on the nations of the world, with particular reference to children's well-being.

The pattern of child deaths (Figs.) 174
Statistical note and index to countries 178

TABLES
1: Basic indicators 182
2: Nutrition 184
3: Health 186
4: Education 188
5: Demographic indicators 190
6: Economic indicators 192

Footnotes and sources 194

PANELS

Guatemala: Halving deaths 1
Papua New Guinea: Prescribing Bottles 2
Brazil: Defeating polio 3
It can be done 4
Ethiopia: A city decides 5
Egypt: Learning from failure 6
Egypt: Halving deaths 7
Kenya: Restoring confidence 8
Nepal: Halving deaths 9
Indonesia: Charting 2 million 10
The Philippines: A hospital leads the way 11
Barbados: Promotion fails 12
Nicaragua and Honduras: ORT cuts deaths 13
Bangladesh: Healing at home 14
Costa Rica: Deaths down 70% 15
Lesotho: Doubling immunization 16
Malawi: Measles down 60% 17
China: Overcoming the odds 18
Colombia: Small is saveable 19
Guatemala: Fortifying sugar 20
Oman: Defeating blindness 21
Indonesia and PNG: Cretinism wiped out 22
Pakistan: Accelerating health 23
Thailand: Training 6000 24
Nepal: Corner shop care 25
India: The Anganwadi solution 26
Recession: The impact on children p 69
The Linkages: Multiplying the impact p142
Stagnation: The case of Bihar p152
Food: The shadows of surplus p166
The Need: A child monitoring system p168

Definitions

The infant mortality rate (IMR) is the number of infants who die before reaching the age of one year per thousand live births in a given year.

The child death rate (CDR) is the number of deaths of children aged 1–4 per 1000 children in the same age group in a given year.

TEXT FIGURES

PART I
1.1 Enrolment of girls in primary schools, 1960–1979
1.2 Infant mortality and its causes, New York City, 1900–1930
1.3 Infant mortality decline in industrialised countries, 1900–1980
1.4 Countries unlikely to reach IMR of 50 by 2000 AD.
1.5 Economic development and infant mortality
1.6 A long way from health
1.7 Share of hospitals in health budgets
1.8 Infant deaths and breastfeeding, Bavaria, 19th century
1.9 Breastfeeding and child survival
1.10 Breastfeeding in Oslo, Norway, 1950–1980
1.11 Child deaths from diarrhoeal infections
1.12 Developing countries producing oral rehydration salts
1.13 Total child deaths from immunizable diseases
1.14 Percentages of children immunized in the first year of life
1.15 Effects of extra food in pregnancy on birth-weights, villages in Guatemala, 1979
1.16 Infant mortality and low birth-weight
1.17 Birth spacing and infant mortality
1.18 Age of mother and infant mortality
1.19 Family size and infant mortality
1.20 Percentage of women with three living children who want no more pregnancies
1.21 Maternal education and infant mortality
1.22 Annual rates of population growth, by region, 1950–2025
1.23 Economic trends and IMR (first 24 hours), United States, 1915–1965
1.24 Income and infant mortality, São Paulo, 1950–1970
1.25 Income and infant mortality, New Delhi, 1969–1974
1.26 Occupation of household head and child death rate, Matlab, Bangladesh, 1974–77

PART II
2.1 Estimated energy expenditure of African and European children
2.2 Prevalence and duration of breastfeeding
2.3 Infant deaths, Baguio General Hospital, 1973–1977
2.4 Incidence of diarrhoea, Baguio General Hospital, 1973–1977
2.5 Infant mortality and intervals between births
2.6 Percentage of infant deaths avoidable by birth-spacing
2.7 Foetal deaths during last two months of pregnancy and deaths during first week after birth, by age of mother
2.8 Family planning: access and use, Kenya 1977–1979
2.9 Global incidence of low birth-weights

PART IV
Table 1 The Recession: annual rate of growth of GDP per capita of developed market and developing countries by region (at constant 1980 prices)
Table 2 Infant mortality rates, female literacy and output per capita in India, selected states
Table 3 Growth rates of Gross Domestic Product and GDP per capita in case study countries 1979–82
Chart 1 Countries studied, ranged by income, dependence on trade and finance, and infant mortality
Chart 2 Relationship between infant mortality rate and economic conditions, Costa Rica 1911–1981
Chart 3 How the recession reaches the child

PART V
3.1 The developing world's share of population, births, and deaths
3.2 Where children die: countries with the greatest number of infant deaths, 1975–1980
3.3 The child's share: deaths under five years of age as a percentage of total deaths
3.4 Why children die: percentage of infant and child deaths from preventable diseases
3.5 Reducing child deaths: trends in infant mortality in the developing countries 1950–1980
3.6 Differences within nations
3.7 The changing pattern: transitions in age of death and cause of death
3.8 It can be done: mortality reduction among children under five, some developing country experiences

I

THE STATE OF THE WORLD'S CHILDREN

1984

James P. Grant

A Revolution for Children

The Challenge
Recession
'Waiting for development'
The new road
The sinister alliance

The Cutting Edge
Growth monitoring
Breastfeeding
Oral rehydration therapy
Expanded immunization
Synergisms

The Mother of Change
Food supplements
Family spacing
Female education
Slowing population growth

Inner Development

A Revolution for Children

In the last twelve months, world-wide support has been gathering behind the idea of a revolution which could save the lives of up to seven million children each year, protect the health and growth of many millions more, and help to slow down world population growth.

Last year's *State of the World's Children* report outlined the recent advances in both biological science and social organisation which now make this revolution possible. Since then, the combined potential of these breakthroughs has been acknowledged by world political and religious leaders including the Presidents or Prime Ministers of Bolivia, Britain, Canada, Colombia, France, Haiti, India, Pakistan, the Philippines, Sri Lanka, Sweden, Tanzania, Thailand, and the United States.

Also in the last year, more evidence has been coming in from around the world to show that these drastic gains in child well-being can indeed be achieved at a relatively low cost and in a relatively short time – despite economic recession. The case studies in this year's report document actual examples of the techniques which make this revolution possible.

In brief summary, those techniques are:-

○ Oral rehydration therapy (ORT) – a simple and inexpensive method of preventing or correcting the dehydration which is induced by diarrhoeal infections and which, with an estimated 5 million young victims a year, is the leading cause of child death in the modern world (see pages 31–41).

○ Growth monitoring – the use of simple 10-cent child growth charts which, along with regular monthly weighing and back-up advice, can help parents to make better use of the food they have and prevent up to half of all the malnutrition in the developing world (see pages 25–27).

○ Expanded immunization – using newly-improved vaccines to prevent the six main 'immunizable' diseases from killing an estimated five million children a year and disabling five million more (see pages 41–45).

○ The promotion of scientific knowledge about the advantages of breastfeeding and about how and when an infant should be given supplementary foods (see pages 27–31).

In several developing countries, commitments have already been made to put these ideas* into action. In response to last year's *State of the World's Children* report the city authorities of Addis Ababa have publicly stated their intention of using these techniques to halve child deaths in the next four years. In Pakistan, the government has launched an Accelerated Health Programme which has already tripled the immunization rate and increased the distribution of oral rehydration salts from 1 million to 5 million packets a year. In Haiti, the response has been the launching of an intensive nation-wide programme with the proclaimed intention of reducing infant and child deaths by at least 25% in the next three years. In Colombia, President Betancur has responded to the report by saying that: '*This document informs on four recent scientific advances and offers the hope that, with a great effort by governments and communities, the outlook (for children) by the end of this century will be much better. All of these techniques will be applied here in Colombia*'.

In New York, UN Secretary-General Javier Pérez de Cuéllar has said that: '*National efforts to mount such campaigns are now possible because the community networks and the means of communicating necessary for parents to learn about the forms and uses of simple therapies are increasingly available in many countries ... Innovative and cost-effective action along these lines would demonstrate that even in times of acute financial strain for social services and international co-operation, it is possible for the world to take imaginative steps to heal some of the most tragic wounds of under-development and poverty. I appeal to national leaders, to communicators, to health-care workers, and to concerned institutions and individuals to support this action.*'

---

*If the three 'F's of food supplements, family spacing, and female education (see pages 49–60) could be added to these four techniques, then the number of children whose lives would be saved – and the number whose growth would be protected – would be even more dramatic. But in comparison with the four simple and inexpensive measures outlined above, family spacing is more difficult, food supplementation is more costly, and extending female education is both.

Guatemala: halving deaths

1

In 1982, almost 400 'health promoters' in the eastern region of Guatemala began distributing oral rehydration salts as part of their routine work in the community. In total, the salts went out to a population of 64,000 people – a population in which the leading cause of child death was the dehydration induced by diarrhoea.

Ready-made sachets of salts were in short supply, but the problem was quickly and cheaply overcome. Using a simplified formula of sugar, salt and potassium chloride, packets of salts were made up at the local health centres. The initial cost of each local production plant was $550. Thereafter, one worker could produce around 300 packets per day at a cost of 1.5 cents each.

From the local centres, the health promoters made their rounds of the community to educate parents on when and how to use the salts. At the same time, posters were pasted up throughout the community warning of the dangers of diarrhoea. Almost all children suffer from diarrhoea some of the time. Most recover quickly, but in about 10% of cases dehydration suddenly sets in and then the child's life is seriously at risk.

Home visits by the health promoters taught parents that it was dehydration which killed their children and that early rehydration – at home – was the best cure. Each family was also given six small (250 ml) sachets of the locally made salts along with a sheet of clear, printed instructions. Because the health promoters were part of the community, they were almost always on hand to give advice and help at the moment when a mother actually had to start giving oral rehydration therapy to her child. After the first few times, most mothers became confident about using the salts and many became active promoters of the idea.

Before the campaign began, knowledge about oral rehydration therapy was almost zero. Packaged salts had been available at pharmacies. But there had been no promotion; so sales were low and costs were high. After the campaign, almost 90% of families with young children had packets of the salts available in their homes and over two thirds knew how and when to use them. The result was that actual use of the oral rehydration technique increased from less than 1% of diarrhoeal cases to more than 30%.

Most important of all, the number of child deaths from diarrhoea fell by half in the year after the introduction of the salts.

Even bearing in mind that yearly fluctuations in the child death rate are not uncommon in the area, the result is an impressive one. The total cost of expanding this campaign to the rest of the country (including the cost of the salts themselves) has been estimated at 4.7 cents per person or 0.2% of the country's health budget.

In the view of those involved in the campaign, the successful introduction of oral rehydration therapy would not have been possible without the spread of a primary health care network which had put a health promoter close to every family and involved people in action for their own health. To make a child health revolution possible, such 'social breakthroughs' are as essential as the technological breakthroughs themselves.

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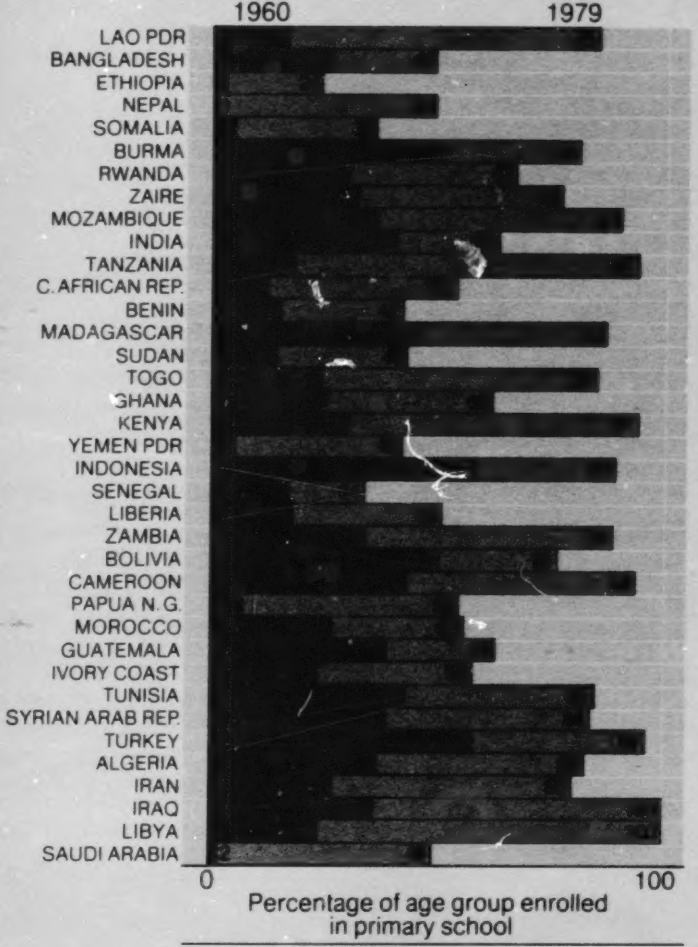
In the industrialised world also, the potential significance of these breakthroughs has not gone unheeded.

In Washington, the U.S. Senate has adopted a resolution saying that: '*the techniques articulated by UNICEF in its report entitled "The State of the World's Children 1982–83" represent an unprecedented low-cost opportunity to significantly reduce child mortality and morbidity throughout the world, and have the full support and encouragement of the Congress at a time of economic difficulty and constriction for all countries.*'

Fig. 1.1 Enrolment of girls in primary schools, 1960–1979



Source: World Bank, World Development Report, 1982

In Rome, the Holy See has announced that '*the entire Catholic aid network in the various countries of the world, and especially in the developing nations, will lend its maximum support to these important simple proposals to improve the health of hundreds of millions of children*'.

The techniques which now make all of this possible have been pioneered in recent years by governments and health ministries; by doctors and paediatricians; by nurses and primary health care workers; by international agencies like UNDP, WHO, the World Bank, the International Red Cross and UNICEF itself; by voluntary agencies like the Save the Children Fund and Oxfam; by religious organisations of many faiths; by secular movements like the Bangladesh Rural Advancement Committee; and by institutions like the International Centre for Diarrhoeal Disease Research in Bangladesh or the Institute of Child Health in London.

Although constantly being refined, the breakthroughs in knowledge and technology already exist. But like all scientific or 'knowledge breakthroughs', an equivalent 'social breakthrough' is also necessary if they are to be taken off the shelf of potential and put at the disposal of peoples. And on this front also, the world has been changing.

Only twenty years ago, for example, the proportion of girls in the developing world who went to primary school and had the chance to become literate was less than 35%. Today it is over 80% (see Figure 1.1). Only twenty years ago, the radio was a rare novelty in the poorest half of the world. Today, there is at least one transistor for every two homes. Only twenty years ago, there were hardly any primary health care workers in the developing world. Today, there are over three million paramedics at work.

In short, these and other social advances of recent times are bringing the world to a position of great potential for progress. Slowly, the channels are being opened up between what science knows and what people need.

Papua New Guinea: prescribing bottles

2

After independence in September 1975, the new government of Papua New Guinea became increasingly concerned about rising malnutrition and diarrhoeal diseases among the young children of the capital city, Port Moresby.

At the same time, surveys were reporting a steep fall in breastfeeding. In 1964, 94% of the mothers who left Port Moresby General Hospital were breastfeeding their babies. By 1974, the figure had fallen to 78%. Over approximately the same period, hospital admissions and deaths from gastro-enteritis had doubled.

A 1975 survey in the city found that 35% of babies were being artificially fed and that over two thirds of them were malnourished. Among breastfed babies, on the other hand, only a quarter were seriously underweight.

By 1976, the government was taking action to halt the decline of breastfeeding in Port Moresby and to prevent the bottle-feeding habit from spreading to the rural areas. All advertisements for artificial infant feeds were banned, and educational campaigns on the advantages of breastfeeding were mounted for health workers, schools and community organisations.

Towards the end of that same year, it was clear that the battle was being lost. Sales of artificial baby milk were hardly affected and the attempt to persuade shopkeepers and supermarket chains to voluntarily restrict sales of feeding-bottles had had little or no effect.

In July 1977, the government passed the Baby Feed Supplies (Control) Act into law. From now on, feeding-bottles and teats could only be bought from pharmacists and only on prescription from a qualified health worker. Before signing such a prescription, health workers were required to make sure that there was a good reason for changing to artificial baby-milk and that the baby's mother knew both how to mix up the formula in the right strength and how to keep the bottle and teat sterilised.

The penalty for supplying feeding-bottles illegally was steep: $300 for a first offence and $750 for second and subsequent offences. Almost overnight, feeding-bottles disappeared from the shelves of Port Moresby's shops.

In March of 1979, a follow-up survey found that the proportion of breastfed children had risen from 65% to 88% and that the proportion of seriously undernourished infants had fallen from 11% to 4% over the same period. Among children who were still being bottle-fed (almost all of whom had a prescription) the incidence of malnutrition had been halved.

By 1982, Port Moresby General Hospital was reporting a considerable drop in the number of young infants admitted for diarrhoeal disease. In the paediatric unit, only one child has died of diarrhoeal infection in the five years since legislation was introduced.

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Coming together at this time, these breakthroughs in both science and social organisation could soon be helping to save the lives of half the 40,000 young children who now die every day.* They could also prevent several million children a year from becoming mentally or physically disabled. And UNICEF would not be worthy of its name if it did not now make the strongest possible appeal to the world that a children's revolution could and should begin.**

In all of this, the national and international media, so often criticised for conveying only the immediate at the expense of the important, have made an indispensable contribution. Several thousand articles and editorials in newspapers and magazines, plus extensive coverage on television and radio around the world, have carried the message of hope to hundreds of millions of people. Other than the 'hard news' of world events, the story of the potential revolution in child well-being has been one of the most widely reported and analysed international news stories of recent decades. The response of the public, world-wide, has revealed again the deep longing among ordinary people everywhere for a world in which children no longer suffer and die in numbers which are beyond the emotional embrace of the individual but which haunt the conscience of mankind.

In a relatively short space of time, therefore, the individual techniques which could bring about this revolution have been pioneered, their combined potential has been articulated, and the news of their availability has been warmly welcomed. But this is not enough.

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*Paradoxically, the reduction of infant and child deaths by half would lead to a fall in birth-rates and the stabilisation of world population at an earlier date and at a lower level. Pages 60 to 63 of this report discuss the relationship between infant deaths and infant births.

** In May of 1983, the representatives of the 41 nations on the Executive Board of UNICEF formally endorsed the measures set out in the 1982-3 'State of the World's Children' report.

The Challenge

The fact that a major improvement in the health and well-being of the world's children *can* now happen does not automatically mean it *will* happen. And the challenge ahead is the challenge of translating the local successes which show that a child health revolution is a *possibility* into intensive national campaigns which will make that revolution into a *reality*.

That challenge is now primarily political rather than technical or financial. The evidence leaves no room for doubt that low-cost techniques are available to act as a springboard for this great leap forward for the world's children. Any government which now decides to make a serious commitment to saving the lives and protecting the health and growth of its children can now move towards that goal. And any government, institution, or individual in the industrialised world wishing to assist in that process also now has a clear opportunity to do so.

Money is important and more is needed. But a much greater need is the mobilisation of existing human resources and organisations behind this great cause. For a children's revolution cannot be accomplished through exclusively formal channels or by rigidly conventional means. In most nations, for example, official health services do not reach more than a quarter of the population. Bringing the benefits of recent breakthroughs to *all* children will therefore depend on the health professionals lending their expertise to much more far-reaching campaigns involving people, institutions, and channels of communication which go far beyond the present scope of the health services themselves.

3

Brazil: defeating polio

In 1979, poliomyelitis killed or crippled 2,564 children in Brazil. It was an average year. Immunization against the disease had been slowly expanding for 20 years. But it was still only reaching a small proportion of the nation's children.

In 1980, the government decided that progress was too slow and that something special had to be done. With the personal backing of the President, and with the support of all government ministries, the Polio Control Operation was launched, adopting the optional approach of two doses of oral vaccine six weeks apart.

So the second Saturday of June and the third Saturday of August were declared national vaccination days. Saturdays were chosen so that parents would be free to bring their children for immunization. June and August were chosen because they are two of the coldest months of the year in Brazil and therefore the easiest months to keep vaccines cool.

The logistical problems of immunizing all the nation's children on one day could only be overcome by involving every kind of organisation – community groups, peasant co-operatives, youth groups, women's groups, neighbourhood associations, the churches, the schools, and the army, as well as the health services themselves. In readiness for the two days, 90,000 immunization posts were set up across an area larger than Western Europe or the continental United States. And because the oral vaccine can be simply dropped into the child's mouth, the campaign did not have to rely on highly qualified medical personnel. Instead, an army of 320,000 volunteers was recruited for the campaign.

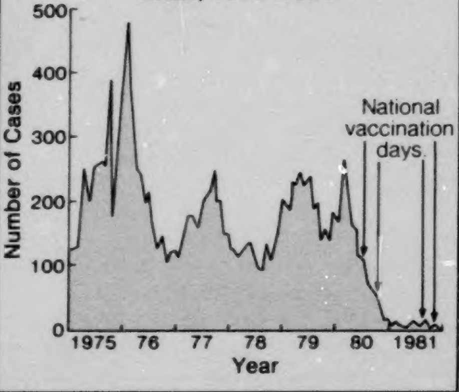
In the days and weeks before the two national vaccination days, the media took the immunization message into almost every home in Brazil. On the nation's 123 television stations and 1,200 radio stations, 30-second immunization broadcasts were made 20 times a day. In the major cities, the print media gave space day after day for the campaign. In the villages, 3,900 loudspeaker services toured the streets broadcasting the same message and urging parents to turn up with their children on the appointed days.

Existing vaccination records were very poor and it was almost impossible to decide which children had been vaccinated and which had not. The solution was simple and workable – vaccinate them all. So in the fall of 1980, 18 million children were given the two doses of vaccine against polio. The chart shows the results.

The national vaccination days were repeated in 1981, 1982 and 1983. In September 1983, the total of confirmed polio cases among Brazilian children was 10.

Over 50,000 children are killed and half a million are crippled by polio every year in the developing world. If Brazil's immunization coverage were to be achieved by all developing countries, then this annual toll on the lives and health of the young could be reduced by 99%.

Poliomyelitis cases, by 4-week periods, Brazil, 1975–1981



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That is why the UNICEF office in India, for example, is helping to organise national workshops on the 'children's revolution' for leaders of labour and industry, agriculture and education, the media and the voluntary organisations. '*Experience provides conclusive proof,*' says UNICEF's Regional Director in New Delhi, '*that we must mobilise all organised resources if impact is to be accelerated*'.

'Mobilising all organised resources' is the key to unlocking the present potential for drastic improvements in the health and well-being of children. For the great barrier to be overcome is the lack of awareness among parents, communities, opinion leaders – and even some health professionals – about the means now available for saving and nurturing life. Overcoming that lack of awareness will require the help and involvement of all the myriad social, political, and professional groups which can, on large scale and small, act as channels of support and communication to reach out and help parents to use present knowledge and new techniques to ensure the survival, growth, and development of their children.

'Organised resources' for promoting knowledge of these techniques can therefore include the paediatricians and the doctors; the nurses and the paramedics; the agricultural extension services and the community development workers; the parliamentarians and the local officials; the teachers and the schools; the colleges and the universities; the medical schools and the research institutes; the churches and the clergy; the mosques and the imams; the trade unions and the employers' federations; the lawyers and the engineers; the commercial communities and the women's associations; the voluntary organisations and the aid agencies; the environmental groups and the family planning organisations; the Boy Scouts and the Girl Scouts; the traders and the shopkeepers; the youth movements and even the children themselves (see panel No. 21).

Whether or not people and their organisations become involved on this scale will decide whether or not the children's revolution will realise its potential. Oral rehydration therapy (ORT), for example, can in theory save the lives of most of those five million young children who now die each year from diarrhoea-induced dehydration. But if only 10% or 20% of children are in contact with modern health services, then many other channels will have to be used to put the ORT breakthrough at the disposal of the majority. And the fact is that ORT – which *The Lancet* describes as '*potentially the most important medical breakthrough this century*' – will not reach more than a small proportion of the children who need it unless it is also promoted through the primary schools and colleges; through the churches and the temples; through the women's nutrition classes and the work-place; through the water engineers and the extension workers; through the transistor radio and the press; through the television and the video-recorder; through the centres of culture and entertainment; and through every other channel which can reach out to help link present knowledge to people's needs.

This is the 'social breakthrough' which is every bit as important as the technical breakthrough itself if ORT – and the other main elements in the child health revolution – are to come anywhere near their dramatic potential for saving the lives and improving the health of millions of children throughout the world.

In almost all the places in the world where available 'solutions' are going into action on a scale commensurate with the problems, these social and communications breakthroughs are the visible – if varied – common factor:-

In Nicaragua, 80,000 volunteers – farmers, students, workers – are taking the message of ORT to every region of the country. In Honduras, intensive year-round radio campaigns have taught almost all women how to make an oral rehydration mixture. In Brazil, over 300,000 volunteers – drawn from women's groups, church organisations, peasant co-operatives – have helped to reduce polio by 99% in the last three years. In Costa Rica, radio, television, and press campaigns have probably been more important than the health services themselves in promoting public education about health and hygiene. In Colombia, priests are introducing lessons about immunization and ORT at pre-marriage and pre-baptism counselling sessions. In Haiti, attempts are being made to have sachets of oral rehydration salts sold in every

4

It can be done

It has sometimes been argued that direct attempts to reduce child deaths and improve child health are doomed to failure in the absence of overall social and economic development. But recent experience suggests that such direct campaigns can bring about significant improvements in the lives of children even in poor communities. At the same time, they can also help in the struggle towards longer-term change by protecting the normal mental and physical growth of the next generation.

Ten such projects (covering populations of 60,000–70,000) were recently examined in a study for the Overseas Development Council by Davidson Gwatkin, Janet Wilcox and Joe Wray.* The projects were chosen not for their apparent success or failure but for the completeness of their before-and-after records. Some of the results:-

○ Four years after a major project was started in Imesi, Nigeria, infant mortality was down to 50 per 1,000 in the project area as opposed to 91 per 1,000 in nearby villages.

○ In northern Peru, a health and nutrition campaign brought the infant death rate down to 48 per 1,000 as opposed to 134 per 1,000 in nearby areas.

○ In Jamkhed, India, infant mortality in the small sample population surveyed had fallen from 97 to 39 per 1,000 over the five years of the project's operation.

○ In Hanover, Jamaica, the infant mortality rate fell by 25 points between 1970 and 1975 as opposed to only a 3-point decline in Jamaica as a whole.

○ In Narangwal, India, child deaths from diarrhoeal and respiratory infections (the two most common causes) were cut by 50% in 17 months.

○ In a rural area of Guatemala, a five-year effort reduced infant mortality rates from 150 to 55 per 1,000.

In almost all of these cases, child death rates (deaths of children aged one to four) also declined and, where records were kept, average weight-for-age among the children was improved.

The relevance of such campaigns is a function not just of their effectiveness but also of their costs. In seven of the cases studied, the per capita cost of the project was similar to, and in some cases lower than, the per capita health spending of the nation in which the project was set.

A study of the common elements in these successes does not yield any hard and fast rules other than the need for competent and dedicated staffs and management. But in all cases, improved nutrition for young children and pregnant women played a big role in lowering the rate of infant and child deaths. In Narangwal, for example, each 10% decrease in a young child's weight-for-age brought with it a much greater increase in the probability of death. Growth charts, pioneered with great success at Imesi and refined at Narangwal and Hanover, helped reduce child deaths and improve child health by making possible the early identification of children at risk.

Finally, the authors noted a less obvious common factor: '*A principal characteristic that seemed to distinguish the more successful from the less obviously successful projects,*' they concluded, '*was the degree to which they departed from the Western tradition of hospital-based, high-technology medical services in the search for approaches more appropriate to village conditions.*'

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*Davidson R. Gwatkin, Janet R. Wilcox and Joe D. Wray, _Can health and nutrition interventions make a difference?_, Monograph No. 13, Overseas Development Council, February 1980.

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village store and every neighbourhood corner-shop. In Nepal, small drug store owners have got themselves trained to give basic advice to customers who have no other health services. In the Yemen Arab Republic, 200 self-help associations funded by an Islamic community tax or *zakat* are beginning to provide basic health care to villages. In parts of Oman, one child in each school is trained to prevent trachoma among fellow pupils. In the Philippines, the staffs of maternity hospitals are becoming involved in educating all new mothers about the advantages of breastfeeding and the dangers of the bottle. In Bangladesh, 900 workers for the Bangladesh Rural Advancement Committee are visiting literally millions of families to bring the news about ORT. In Indonesia, 7,000 family planning workers have been retrained to help teach mothers in 15,000 villages about the use of child growth-monitoring charts. In country after country it is this involvement and commitment of organisations and individuals which now offers the potential for both creating and sustaining a revolution in the survival and well-being of the world's children.

The challenge of the children's revolution is therefore a challenge for both governments and *people*. And for those who might doubt what ordinary people can achieve in the service of such a cause, it is worth recollecting that it is movements which have enlisted the commitment and caught the imagination of people which have brought about some of the greatest political and social changes of our times – the movement for political independence in the Third World; the movement for civil rights in the United States; the movements for the ending of unjust wars; for the protection of the environment; and for the rights of women.

In the past, such movements have been initiated and sustained primarily by those who were the victims of the wrong they sought to right. Children cannot start such a movement in their own defense. Yet in the last year alone the 15 million young children who have died in the developing world is the equivalent of the entire under-five population of the United States of America. On a European scale, it is as if the combined under-five populations of Britain, France, Italy, Spain, and the Federal Republic of Germany had been wiped out in a year. And for every child who has died, another has been left blind or deaf or crippled or retarded. Could any cause be counted more worthy of a people's movement?

Recession

The 1980s may seem an unlikely time to be talking of a 'great leap forward' for children (see pages 69–70). An entrenched economic recession, and the lack of any present momentum towards a more just and workable world economy, mean that there is now very little realistic hope of any significant increase in the resources available for social progress during the remaining years of this decade.

Although pressure for accelerated growth and a more just and prosperous world must be sustained, the fact has to be faced that there will be very little social progress over the next decade if that progress is to depend mainly on increasing the financial resources available for it.

The central question for both industrialised and developing countries in the 1980s is therefore '*how can human progress be maintained in the absence of increased economic resources?*'

Faced with an analogous question during the oil crisis of the 1970s, the automobile industry responded by making cars lighter, engines more efficient, and styling more aerodynamic. In other words, progress was maintained by making better use of available resources. And for the maintenance of social progress in the 1980s, there is no realistic alternative but to apply that same principle. For the rest of this decade, 'making more of what you have' will surely be the first principle of progress.

In the industrialised world, this principle may not prove to be too penurious. In health, for example, the restriction on resources comes at a time when progress has become less dependent on advances in health technology and more dependent on 'costless' changes in the way we live. America's prestigious Center for Disease Control in Atlanta has recently stated that the average 50-year-old American male, for example, could add 11 years to his life expectancy through four 'free' measures – not smoking, drinking alcohol only in moderation, avoiding obesity, and taking regular exercise. In other words, spectacular progress in health is still possible despite restrictions on resources.

In the developing world, on the other hand, there remain many fundamental needs which cannot be met without substantial economic progress. Two thirds of all the under-fives in the developing world, for example, still have no access to clean water.

Yet even in the poorer half of the world, doors are opening through which progress might still be made. And again, the way forward is lit by the principle of making more of what is available and finding ways to change the ratio between resources and results.

It is from this same principle that the present potential for improving the lives of the world's children now arises. Without new *ideas and strategies*, several million more children are going to die in the decade ahead than was thought possible even three short years ago, and many millions more are going to suffer mental and physical damage – unless a new way forward is found.

UNICEF believes that a new way forward for children in the 1980s is now available. Primary health care is the *idea* which makes this revolution possible. The spread of education, communication and social organisation is the *circumstance* which makes it practicable. Growth monitoring, oral rehydration therapy, the promotion of breast-feeding and expanded immunization, are the *techniques* which make it affordable even in the midst of recession.*

This report now turns to each of these three elements. Together, they add up to a possibility – not an inevitability: and the difference is the will and commitment of governments and peoples to bring about this revolution in the well-being of the world's children. For this alone is the switch which could now set the current of action running through this circuit of unprecedented opportunity. A children's revolution is possible – if the world wants it.

Waiting for development

As a statement of the need for a children's revolution, and as a measure of its progress, the infant mortality rate (IMR) is perhaps the most crucial of all available statistics. Technically, the IMR is the number of deaths below the age of 1 year for every thousand live births. But because it is a statistic which has as much to say about the quality of children's lives as about the quantity of their deaths, it is also one of the most eloquent indicators of development itself. That is why the new statistical appendix, attached to this year's report, lists the countries of the world not in rising order of their gross national products but in descending order of their infant mortality rates.

The justification for this central place given to the IMR in UNICEF's thinking is not just that an improvement in the lives of children is as important as, and not necessarily a function of, economic growth. It is that – unlike GNP per head, which can be increased significantly by the disproportionate wealth of a minority – the IMR can be substantially reduced only by improvements in the life and health of the majority.

A revolution in child survival and development can therefore most easily be measured by falling death rates for infants and children. In the past, the conventional wisdom has been that further significant improvements in the lives of children – and consequent reductions in the IMR – depend primarily on accelerated economic development. UNICEF does not accept that view. Whilst recognising the important contribution of economic growth to the lives of children, we also believe that the means are at hand to make the protection of the mental and physical growth of children into a cause as well as a consequence of economic advance. For we believe that there is a

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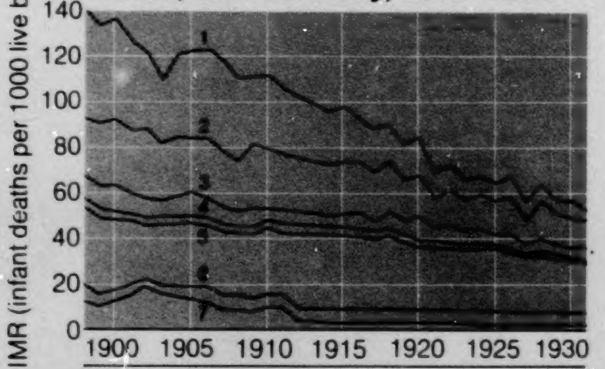
*As a convenient mnemonic, these 'cutting edge' techniques are often referred to as GOBI-FFF – standing for *G*rowth monitoring, *O*ral rehydration therapy, *B*reastfeeding, and *I*mmunization – plus the equally vital but more difficult and costly elements of *F*amily spacing, *F*ood supplements, and *F*emale education (see pages 49 to 60). There are, of course, other priority problems – especially malaria, intestinal parasites, iodine deficiencies and upper respiratory infections – and the precise mix of appropriate activities needs to be decided on in response to local problems and in consultation with local communities. The 'GOBI' elements are distinguished by being low in cost and universal in relevance.

Fig. 1.2 Infant mortality and its causes, New York City, 1900–1930



Key
1 Digestive system (diarrhoea)
2 Respiratory infections, mostly pneumonias
3 Infectious diseases
4 Tuberculosis
5 Premature birth, injury at birth, other diseases peculiar to early infancy
6 Congenital malformations
7 All other causes

Source: New York City Department of Health, 1932

profound connection between the growth of the mind and the body in childhood and the growth of economies and the progress of nations.

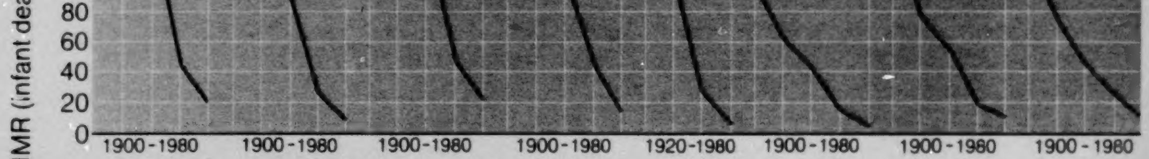
Nonetheless, it is an illuminating argument, for it exposes the historical roots of the present case for a child health revolution.

Less than a hundred years ago the infant mortality rate in Europe and North America was as high as it is in the developing world now. In New York City in the year 1900, for example, the IMR was approximately 140 per 1,000 – about the same as in Bangladesh today. In the city of Birmingham, England, a survey taken in 1906 revealed an IMR of almost 200 per 1,000 – higher than almost any country in the world in the 1980s.

A look behind these statistics also shows that the main causes of infant death in New York and Birmingham *then* were very much the same as in the developing world *now* – diarrhoeal diseases and malnutrition, respiratory infections, and whooping cough (see Figure 1.2).

Over the next fifty years, infant death rates in the industrialised world fell more steeply than anyone would have believed was possible (see Figure 1.3). In New York, the IMR dropped from 140 to around 30 by the middle of the

Fig. 1.3 Infant mortality decline in industrialised countries, 1900–1980



Sources 1. *U.N. Demographic Yearbook, 1948, 1955, 1979, (supplement), and 1981*
2. *B.R. Mitchell, European Historical Statistics, 1750-1970. Abridged edition. The McMillan Press Ltd. 1978*
3. *Michael Haines and Samuel Preston. New Estimates of Child Mortality in the U.S. in 1900. Wayne Economic Papers. No. 141. October 16, 1981*

23

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Ethiopia: a city decides

In response to the present potential for a child health revolution, the City of Addis Ababa, Ethiopia, has decided to cut child deaths by half within the next four years.

With a population of 1.5 million, Addis Ababa is already one of the largest cities in Africa, and at its current growth rate the population is due to double within ten years. Though shanty towns have not mushroomed around Addis as they have done in so many other African cities, many parts of it are unplanned and overcrowded, with poor housing and little sanitation. There is no question that its children need health care: barely one in three children are vaccinated, and large numbers suffer from diarrhoeal diseases, tuberculosis, respiratory infections and malnutrition. Nearly 40% of all the deaths in the city are attributable to parasitic or gastro-intestinal diseases, and young children, as always, are the hardest hit.

The city is divided into 284 autonomous divisions, or city-dwellers' associations (*kebele*), which are due to play a key role in the accelerated health care programme; in each *kebele* one paid health worker and one unpaid will be trained to provide health services and to co-ordinate the effort as a whole.

The main thrust, however, will come from the *kebele* families themselves; and the effort to educate and motivate them will draw on every available source – city council and *kebele* health committees, government ministries and university departments, the National Children's Commission, the Ethiopian Women's Institute, the Revolutionary Ethiopian Women's Association, and the Revolutionary Ethiopian Youth Association.

Specific goals have been set. The initial aim is to halve the infant mortality rate, from 150 to 75 per 1,000, within four years: all mothers and children under two are to be fully immunised; all mothers will be educated about oral rehydration and how to use it (plans are already afoot for the local manufacture of salts); and mothers will be trained to monitor the growth of all children under three, receiving nutritional advice and supplementary foods when these are needed.

In the second phase of the programme, directed at bringing infant mortality down to 50 per 1,000 by 1990, these measures will be complemented by regular food supplements for pregnant women and children and pre-natal and post-natal care for all who need it. And, most importantly, by work to make the *kebele* health system entirely self-sustaining.

Addis Ababa stands on the threshold of its own child health revolution. The plans are in place, and the political commitment is there. The next four years will tell if the hope becomes a reality.

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century. And in the 40 years following that 1906 survey in Birmingham, the infant death rate fell from 200 to 46 per 1,000.

Throughout the industrialised world, the mainspring of this great leap forward was rising living standards – better food, water, housing, sanitation, education and income. Although the spread of maternal and child health care was undoubtedly an important factor, health technology and medical services played only a secondary role. Effective vaccines against measles, for example, only became available *after* child deaths from measles had been reduced to almost zero by better nutrition.

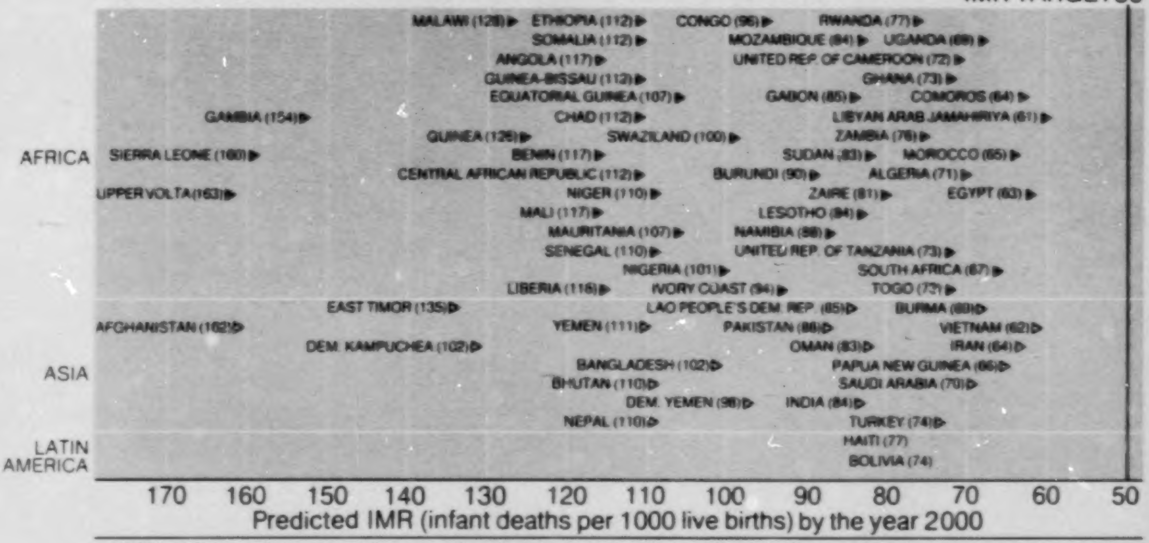
Around the middle of the century, or just before, infant deaths began a similarly steep decline in Africa, Asia, and Latin America. From around 200 per 1,000 in 1950, for example, the IMR in the poorer half of the world fell to around 100 by 1975 – a drop of 50% in only a quarter of a century. To most observers, it seemed as though the developing world was following the path beaten by the industrialised world and it was confidently expected that infant deaths would continue to fall. As late as 1980, the General Assembly of the U.N. adopted the target of reducing infant deaths to 50 or less per 1,000 births in all nations by the year 2000.

Unless there is a sudden acceleration of progress, that target will not now be achieved. Latest indications are that more than 70 nations will still have infant death rates considerably higher than 50 per 1,000 by the end of this century (see Figure 1.4). And in those 70 nations, 3 out of every 5 of the world's children are born.

What has gone wrong? Why is progress in child health slowing down? And why have infant death rates not continued to fall steeply in the developing world as they did in the industrialised world?

The different pattern of declining infant deaths reveals the different balance of forces at work behind the scenes in the two different worlds. In

Fig. 1.4 Countries unlikely to reach IMR of 50 by 2000 AD.



In 1980 the General Assembly of the United Nations adopted the target that infant mortality rates should be reduced to 50 per 1000 or less in all countries by the year 2000. On present trends, the 62 nations above will all have infant mortality rates of over 60 per 1000 by the end of the century and are therefore highly unlikely to achieve the target. The position of each country indicates its expected year 2000 infant mortality rate, based on present trends.

Source: United Nations. *Infant Mortality: World Estimates and Projections 1950-2025*.

Egypt: learning from failure

6

The 'Menoufia intervention' aimed to bring better health to the 1.4 million villagers of the Menoufia governorate in Egypt's Nile Delta. In particular, an attack was to be launched against the diarrhoeal diseases which were killing one child in every twenty.

By May of 1979, women with secondary school education had been recruited and trained in each of 105 villages. Over the next three months, these oral rehydration promoters visited 45,000 mothers to explain where to get and how to use the oral rehydration salts which, when mixed with the right amount of water, can prevent the deadly dehydration caused by diarrhoea.

The organisers of the campaign knew that they were not tackling the basic causes of infection. But plentiful water, safe sanitation, and home hygiene will take a long time. Meanwhile, 4,000 Menoufia children were dying every year from diarrhoea. And it had been shown in other parts of the developing world that oral rehydration therapy could save most of those children's lives. Privately, the organizers expected the Menoufia campaign to cut the child death rate by between a third and a half.

But it soon became clear that things were not going according to plan. And by the end of the first year, the death rate from diarrhoeal disease in the six 'treatment villages' remained at 55 per 1000 – the same as in villages untouched by the campaign. 'The conclusion that emerges,' wrote Belgin Tekce, the task leader in charge of research, 'is that the intervention was not effective in lowering death rates due to diarrhoea among children in the treatment villages.'

So what had gone wrong in Menoufia?

To find out, the organizers looked to the detailed information, gathered from mothers, on what exactly had happened in the last days and hours of life for each of the 171 children who had died of dehydration during the year.

Gradually, an explanation began to emerge. In the treatment villages hardly any of the mothers had actually tried to use the oral rehydration salts in their own homes. Ninety per cent of all the mothers whose children had died had sought professional medical help – some of them even making two or three visits to a clinic. Once there, most of the children had been given tablets or injections or even intravenous feeding before they had died. Only a third of the mothers had been advised to try oral rehydration and by that time it had been too late.

In short, the whole Menoufia intervention rested on an educational campaign which failed. Questioned afterwards, most mothers were so uncertain about when and how to use the salts that they either didn't use them at all or used 'too little, too late'.

One reason for the failure, the organisers suspected, was that the young village women who had been responsible for promoting oral rehydration therapy had 'lacked credibility'.

The post-mortem also turned up one other likely reason. Neither the communities themselves nor the local doctors had been involved in the campaign. The result was that there was neither moral support nor practical help to encourage mothers to use oral rehydration therapy when their children became ill.

The moral of Menoufia is an obvious one. Having the right technology is only half the battle. Empowering mothers to understand and take charge of that technology to save their children's lives is another story.

In Menoufia itself, the lesson of year one has been learned.

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the industrialised world, the dominant force was economic and social progress with medical services playing a supporting role. In most of the developing world, this pattern has been almost turned upside down. Newly-available interventions such as insecticides and antibiotics, transport and the control of mass famines, immunizations and epidemic control, have made the major impact; overall development and rising living standards took the supporting part. In India, for example, fully a quarter of the fall in child death rates was brought about by DDT-spraying campaigns against the malaria-carrying mosquito.

Sooner rather than later, progress based on such a pattern was bound to run up against its own inherent limitations. Modern medical services are too expensive for economically poor countries to provide to the majority of their people in such a short space of time; nor were such services designed to do battle with the great alliance of malnutrition and infection which was and is still the most important threat to life and health for the majority of families in the developing world today.

In consequence, the steep decline in infant deaths is now slowing down at a much earlier stage, and at a much higher level, than in the industrialised world. In the poorest countries, containing half of the world's people, average infant mortality rates are still reluctant to fall below 100 per 1,000 births* – as opposed to 20 or less per 1,000 in the industrialised nations today. And in the gap between an average IMR of 100 and an average IMR of 20, fall the bodies of approximately 40,000 children each day.

From this brief account of falling infant death rates in industrialised and developing worlds, it might seem reasonable to argue that only overall development can now re-accelerate progress for children and lead to further significant falls in infant death rates.

If that were true, then the outlook for the world's children would indeed be bleak. As the half-way point in the 1980s approaches, the high road to economic development remains almost impassable, blocked by world recession, by debt crises, by declining terms of trade, by internal social disorder, by high unemployment, and by stagnating levels of aid. Meanwhile, progress towards a more just and workable international economic order remains becalmed.

To further darken this outlook, a glance down the too-long list of nations with high infant mortality rates despite their relatively high levels of GNP will demonstrate that there is nothing either rapid or automatic about the conversion of economic progress into tangible benefits for the poorest children and their families (see Figure 1.5).

So to accept the argument, and to wait for recession to step aside and allow economic development to resume its slow walk towards social improvement, is to accept that tens of thousands of children will continue to die each day and that millions more will live on in hunger and ill-health – a state of affairs which can and does undermine the very process of economic development itself.

What would these children say if they had a voice in world affairs? What would be their view about waiting for development?

These children do not die from exotic causes requiring sophisticated cures. Five million of them die in the stupor of dehydration caused by simple diarrhoea. More than three million die with the high fevers of pneumonia. Two million die marked by the rash of measles. A million and a half die racked by the spasms of whooping cough. Another million die with the convulsions of tetanus. And for every child who dies, many more live on in hunger and ill-health.

There has to be a better way forward, and there is.

The new road

In more recent years, a large body of evidence has accumulated to show that rapid progress in child health and well-being – including a further halving of infant mortality rates from around 100 to less than 50 per 1000 – can be achieved in low-income nations without waiting for GNP to lead the way. Pre-eminent among that evidence are the

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*In some African countries, the IMR is above 200 per 1,000.

Egypt: halving deaths

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The Menoufia experience (see panel previous page) painfully demonstrated an obvious truth: oral rehydration therapy can only reduce child deaths from diarrhoea if mothers are informed and confident about why, when and how the salts should be used.

It was a lesson well learned by the organisers of a second attempt to introduce oral rehydration into Egyptian villages. Leading the campaign was Dr. Sunny Salaam, of the University of Alexandria, and this time the team knew that what was on trial was not the treatment itself but their own ability to put the life-saving salts at the disposal of mothers.

In 1980, two more villages in the Nile Delta – Berket Ghatas and Kafala – were chosen. Each had a population of around 4,000. Careful advance study threw up vital details – like the fact that the commonest kind of drinking glass used in the villages held about 200 ml. For easy measuring of the right mix, that meant that smaller packets of salts were needed. A brand called *Rehydran* was the one finally chosen.

In both villages, sachets of *Rehydran* were made available in the normal government health clinics and volunteers visited every family every two weeks to check on cases of diarrhoea and advise mothers on what to do about it. But in one of the villages – Berket Ghatas – the promotional campaign went way beyond the boundaries of the health service.

In Berket Ghatas, *Rehydran* was sold in every corner shop and small village store as well as at the health centres. And for a full year, the community was blitzed with information about how to stop diarrhoea from killing children. Meetings were held with community leaders and religious figures as well as doctors. Talks were given in the market-places, in the washing yards, in the schools, and at the festivals as well as at the clinics. Local entertainers were persuaded to include the *Rehydran* message in folk songs and plays. Cars toured the streets with public address systems blaring advice on oral rehydration. Everywhere, posters reinforced the message.

'In Berket Ghatas,' says Dr. Salaam, 'we went into the community because it is not just the mothers who decide what to do about diarrhoea, it is the fathers, grandparents, local healers, shop owners ... the whole community influences the way people think and act.'

By the end of the year, every mother in Berket Ghatas had heard about *Rehydran* and three quarters of them knew how to use it properly. When asked how diarrhoea should be treated, 87% of Berket Ghatas mothers said 'Rehydran' – as opposed to only 12% in Kafala, where no special promotion campaign had been mounted.

Most important of all, the number of child deaths in Berket Ghatas was more than halved by the oral rehydration campaign.

The basic causes of diarrhoeal infection – inadequate water, sanitation and hygiene – have not been changed in Berket Ghatas. That campaign is still to come. But Dr. Sunny Salaam believes that something equally fundamental has been changed by their work. 'This research has left something with this village,' she says, 'changed it in ways you cannot really understand unless you understand Egypt. Before, people did not even think of diarrhoea as a disease, or that it was not natural for children to die from it... But now, we have turned mothers into doctors. They are treating their own children. This change is more important than you can imagine, and to have made this change in people's lives is an accomplishment.'

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historically significant examples of the People's Republic of China, Sri Lanka, the two Koreas, Taiwan, and Kerala. In all of these cases, the infant death rate was brought down to around 50 per 1000 or less at levels of economic development which were lower than the average for the developing world today. And in all of these cases, this dramatic progress was achieved at a level of GNP lower than $400 per person. But all managed to reduce their infant mortality rates to levels far lower than the levels now prevailing in many middle-income countries where per capita GNP ranges from $1500 to $2300 a year. This ability to 'make more of what you've got' has not proven to be the prerogative of any one political or economic system. And nothing could show more clearly that drastic improvements in the health and well-being of a nation's children need not wait on, and do not depend on, economic growth alone.

Secondly, there is the recent evidence of direct attempts to improve child health and nutrition on a large scale and at a low cost in economically poor communities in many different parts of the developing world (see panel No. 4). Summarising the evidence of ten such attempts in the developing world, a recent study came to the no less than stunning conclusion that '*taken together, they represent a persuasive case that, in the hands of able leaders and in populations of up to 60,000 to 70,000, well designed and effectively operated projects can reduce infant and child mortality rates by one-third to one-half or more within one to five years, at a cost of less than the equivalent of 2% of per capita income – an amount no greater than that currently being allocated to health nationally*'.*

Examples such as these, on large scale and small, were the grist brought to the mill of the first International Conference on Primary Health Care which met in the Soviet city of Alma Ata towards the close of 1978. There, a new relationship between health and economic development began to be worked out.

The negative premise of Alma Ata was that Western style health systems – on which so many developing countries had based their own health strategies in the immediate post-colonial period – were failing to meet the health needs of the majority and could no longer be looked to as the way forward. The positive impulse, on the other hand, was the realisation that new ways forward were now opening up – ways designed in, by and for the developing world, ways which held out the hope of a much greater improvement in health for much larger numbers of people.

The new ways forward were based not on highly specialised medical personnel working in expensive hospitals with sophisticated technology, but on active communities backed by appropriate technologies and well-trained paraprofessional development workers who were themselves supported by the full range of government services. Such community development workers, it had been shown, could advise on nutrition and water supply; help with hygiene and sanitation advice; organise immunization campaigns; distribute iron folate and vitamin A tablets; handle penicillin and other basic drugs; conduct anti-malarial and anti-parasitic campaigns; advise on family spacing and safer child-birth; deal with common local injuries and illnesses; and refer more specialised problems to more specialised people.

Surveying the hundreds of different versions of this theme brought to the Alma Ata Conference, it was possible to see that the developing world need not follow the same road to health as the industrialised world, that improvements in well-being need not wait upon the attainment of similar levels of economic development, and that the primary health care idea could now change the gearing ratio between health and wealth (see Figures 1.6 and 1.7).

In total, the governments of over 150 nations signed the Alma Ata Declaration on Primary Health Care (PHC). For some, it is so far only a paper commitment. For many, it marks the beginning of a new era in health. And it is that new era, as much as any breakthrough in knowledge or technology, which now makes a child health revolution possible.

In the last year, a major review of progress towards primary health care (conducted by the

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*Davidson R. Gwatkin, Janet R. Wilcox, and Joe D. Wray, *Can Health and Nutrition Interventions make a difference?* Monograph No. 13, Overseas Development Council, Feb. 1980.

Kenya: restoring confidence

8

The health services in most developing countries reach too small a proportion of the people to bring about a child health revolution. For Dr. Miriam Were, who had long believed that Western-style health delivery systems were inappropriate to the developing world, that general problem suddenly became a very practical challenge when she returned to Kaimosi Hospital in her own home region of western Kenya.

After a preliminary survey of the most important health needs in the area, she concluded that three quarters of all illness could be prevented by community-based health care and health education. But she also anticipated what the main stumbling-block would be – an almost total lack of confidence among the people themselves. Local health practices, some of which were very effective, had been crushed by the coming of colonialism and subsequent Westernisation. Health care now had become the preserve of distant professionals. Rural communities, she found, often waited despondently for outside help before tackling even simple tasks.

Beginning in 1977, Dr. Were and her colleagues began trying to build a partnership between the professional medical services and community-based primary health care. Through the local village organisations and the tradition of the *baraza*, or public meeting, 243 communities in the region agreed to participate. Soon, 243 community health workers, selected by their own villages, were being trained by teams of 'facilitators' drawn from different government ministries. Usually, the workers were married women with children – chosen because they were trusted by their communities.

After training, they returned to serve those communities – covering a population of 120,000 people.

The community health workers are now able to teach the use of oral rehydration salts; dispense anti-malarial pills; deal with cases of scabies, intestinal parasites, and eye infections; treat simple cuts or wounds; and refer more serious illnesses to the health centres and the hospital. To tackle the major problem of illness prevention, they now spend two days a week making home visits to teach the importance of taking children for immunization, going to ante-natal classes, breastfeeding and timely weaning, keeping food clean and washing hands, growing vegetables, protecting spring water, keeping kitchens and compounds clean, digging latrines, and filling in pot-holes where stagnant water breeds malaria-carrying mosquitoes. In each community, the priorities for health action are set by the community health committee, which is also responsible for paying the wages of the part-time community health worker and for liaising with the government health services.

Most important of all, the community health workers are attempting to rebuild confidence, to rebuild the idea of *Ikhondo yivohela kwayo* (things you do for yourself will be done, things you leave for others might not).

In 1980, three years after the experiment began, a preliminary evaluation showed that the impact was already remarkable. The proportion of mothers bottle-feeding their babies had fallen from 34% to 2% in the three years. The number of those breastfeeding for longer than 12 months had risen from 65% to 93%. The proportion of fully immunized children had risen from 10% to 41%. Worm infestations had dropped dramatically, from 80% to 6%. The use of pit latrines had risen from 1% to 91% of households. The proportion of homes with stagnant water nearby had fallen from 85% to 15%.

The secret of this success, according to Dr. Miriam Were, is that medical and other professional services were not used in such a way as to crush the people's own confidence or alienate them from involvement in their own health problems.

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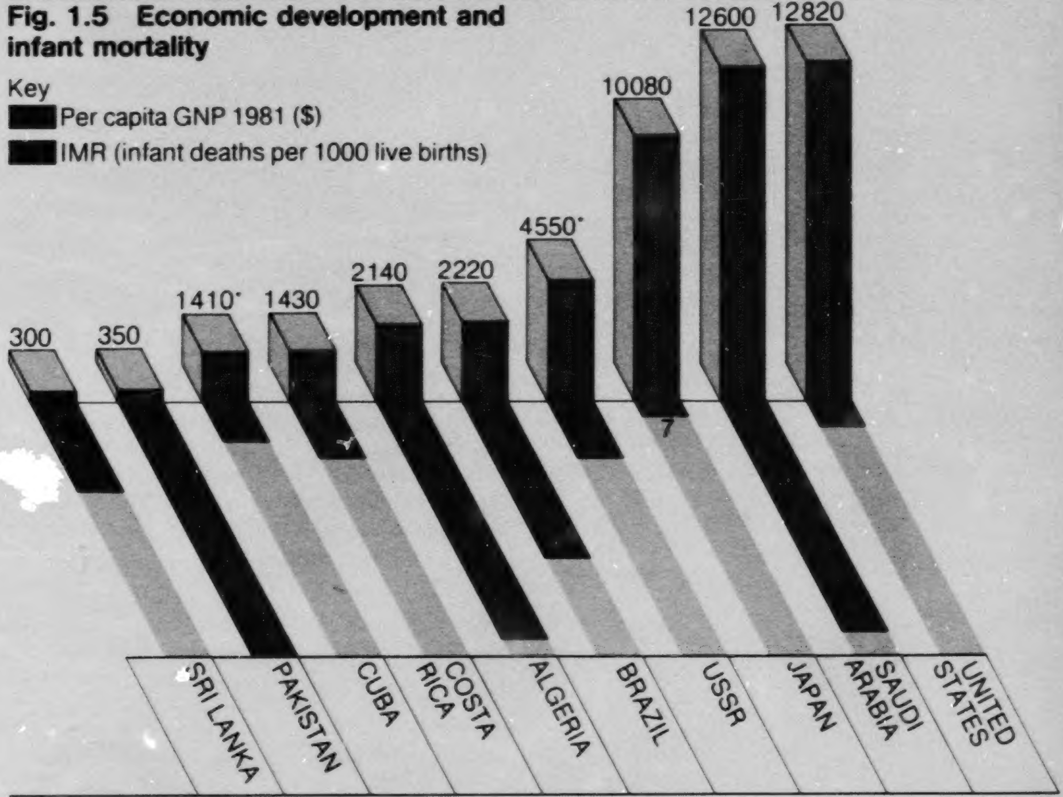
World Health Organization) has found that 49 out of 70 nations studied have drawn up specific plans for implementing the new approach and that many have already trained large numbers of paramedical staff. In India, for example, 200,000 *Health Guides* have been trained since 1977 and a further 380,000 are scheduled to be trained over the next three years. In Latin America, Colombia now has 5,000 *Promotoras* and an almost equal number have been trained in the Dominican Republic.

The spread of such primary health care networks is an important thrust in the social and organisational breakthroughs which are the essential counterparts to the technological breakthroughs now available. But equally important are the opening up of communications channels, the spread of education, and the rise in the numbers of organised communities, action groups, and volunteer organisations throughout the developing world.

In Thailand, for example, almost 47,000 *Village Health Communicators*, all volunteers, are helping to spread new ideas about hygiene and health care. In Burma, there are now 16,000 unpaid *Community Health Workers* and their number is expected to double over the next four years. In Honduras, almost 1,000 *Health Representatives* are organising community action for health and 1,800 *Health Guards* are providing elementary care. In Niger, over 16,000 *Secouristes* are helping to provide health services to rural populations.

Fig. 1.5 Economic development and infant mortality



Note: *Figures refer to 1980.
Source: World Bank, World Development Report, 1982

In addition to these growing armies of voluntary health workers, recent years have seen the increasing involvement of trade union movements, religious organisations, secular voluntary agencies, women's organisations, and youth movements – many of whom are now adopting development action as a common cause.

The sheer scale of all this activity is new. And combined with rapid increases in school enrolment, literacy, newspaper readership, transistor radios, roads and transport, it adds up to a new potential for mobilising human resources and putting low-cost techniques at the disposal of people's health.

Within this new potential, the priorities for action are best decided on in consultation with the communities concerned. Goitre, malaria, trachoma, and river-blindness, for example, are devastating in some communities and almost unknown in others.

But for the children – the children of almost every poor village and neighbourhood anywhere in the developing world – life and health are threatened by a common enemy. That enemy is the alliance of infection and malnutrition which strikes at the growth of both mind and body.

That is why the four actions outlined at the beginning of this report – child growth monitoring, oral rehydration therapy, expanded programmes of immunization, and the promotion of breastfeeding and better weaning – occupy a special place within the idea of primary health care and the circumstance of organisational breakthroughs. For they are the PHC actions which – at low financial and political cost – could bring the most benefits to the most children in most parts of the developing world. And together, they could break the grip of that terrible alliance.

In any community – rich or poor – the best food for an infant is its mother's milk. In any community, the most important single check on a child's normal healthy growth is its regular gain in weight. In any community, the best treatment for a child at risk of dehydration is the early administration of oral rehydration therapy. In any community, the best protection against six of the most dangerous diseases of childhood is complete immunization during the first year of life. But in the developing countries, where so many individuals and organisations are now working to advance the cause of primary health care, these breakthroughs can be decisive:

○ Because all four strategies empower parents to do the best they can for their children, they promote confidence and self-reliance.

○ Because they are simple actions producing tangible results, they can generate enthusiasm for, and acceptance of, the wider cause of primary health care itself.

○ Because they use appropriate technologies, they are available now and at low cost.

○ Because they are involving rather than alienating, depending as much on community support as on professional expertise, they promote the very essence of the primary health care idea.

And because they address themselves to major causes of child illness and child death in almost all communities of the developing world, they have the potential to spearhead a revolution in the well-being of hundreds of millions of small children.

The sinister alliance

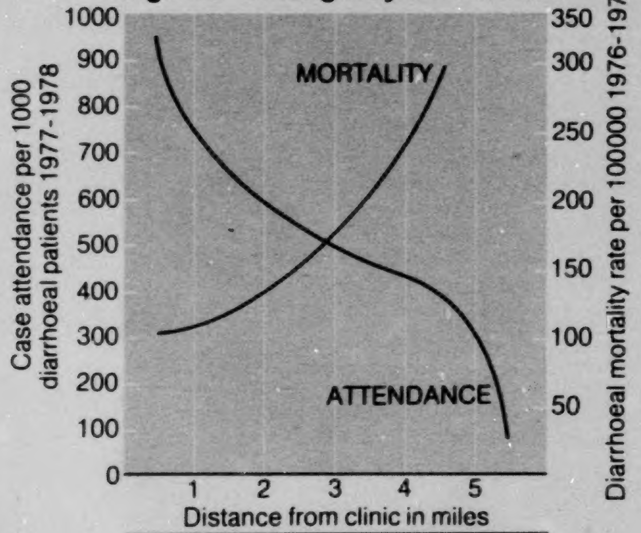
The potential contribution of these four main elements towards that child health revolution cannot really be appreciated without an up-to-date understanding of the main cause of illness and death among the world's children. For although the causes of most of those 15 million child deaths a year – and of an equal number of disabilities – are shamefully simple and ordinary, they are clouded in misconceptions which obscure both the problem and its potential solutions.

Perhaps the greatest of those misconceptions is that malnutrition is caused only by the lack of food. Intestinal parasites can cause malnutrition. Changing from breastmilk to commercial substitutes can cause malnutrition. Not knowing how and when to begin weaning can cause malnutrition. And in half or more of all cases, malnutrition is caused by infection.

In practice, the relative weight of the two main causes – malnutrition and infection – is less important than the synergistic alliance between them. Children with even moderate malnutrition, for example, have been shown to be three times more likely to contract diarrhoeal infections and up to 10 times more likely to die from illnesses like measles. But the infection itself is equally likely to be the cause of the malnutrition. *All* infections have a nutritional impact. They can depress the appetite. They can decrease the body's absorption of nutrients. They can induce rejection of food by vomiting. They can drain away nutrients through diarrhoea. They can induce mothers to stop feeding whilst the diarrhoea lasts.* And by any or all of these methods, infections become a major cause – perhaps *the* major cause – of malnutrition among the world's children.

But the question is not whether the setbacks to the child's normal healthy growth are caused by inadequate food which lowers resistance to infection which causes further malnutrition – or whether infection induces malnutrition which in turn leads to more frequent infection. In practice, both malnutrition and infection are usually joined in a self-reinforcing cycle. And it is this cycle, by the very *frequency* of the attacks which it mounts on the vulnerable body of the growing child, which kills so many millions each year and impairs the normal mental and physical growth of so many millions more.

Fig. 1.6 A long way from health



Relationship between distance from clinic, attendance rates, and deaths from diarrhoeal disease (Teknaf Diarrhoea Clinic, Bangladesh, 1977-1978)

Source: Rahman, M.M. et al. A Diarrhoea Clinic in Rural Bangladesh: Influence of Distance, Age, and Sex on Attendance and Diarrhoeal Mortality. Am. J. of Public Health vol. 72, No. 10, 1982

In the poorest areas of the world, for example, children average 160 days of illness every year. Usually, this will include three or four episodes of diarrhoeal infection, four or five respiratory infections, and one or more of the common childhood illnesses like measles. All of these will cause weight loss which takes time to recover from – and therefore all of them are setbacks to normal healthy growth. Measles, for example, claims 10% of a child's body weight in one quarter of all cases. Similarly, several diarrhoeal infections a year can reduce a child's rate of growth by *half*.

Almost all children suffer some setbacks to that rapid curve of growth which sees a normal baby's birth-weight doubled by about five months, tripled by one year and quadrupled by the age of two. But if those setbacks are frequent and severe, and if there is not enough time between them for the child to recover, then that smooth curve of growth begins to falter and break down.

With the rapid growth of brain and body which occurs in those early years of life, and with each stage of mental and physical development having its own time and place in that process, no child can afford too many such setbacks.*

In practice, the self-perpetuating cycle of malnutrition and infection means that one setback follows another with a frequency which disrupts normal growth during these vital early years. The

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*In many parts of the world, the usual reaction of the mother when her child has diarrhoea is to stop giving the child food and drink. Although this seems natural, it can assist both dehydration and malnutrition.

*Malnutrition and poor health have been shown to affect mental development both directly through physiological impact on brain growth and indirectly through lower energy and 'interest in life' at a stage when interaction with the environment, play and discovery, are important to a child's mental development.

Nepal: halving deaths

9

In 1982, the government of Nepal had deployed 714 full-time paramedics in 492 *panchayat* or district clinics. On taking up their posts, the first task of these intensively trained health workers was to visit every family in the *panchayat*. Thereafter, regular follow-up visits concentrated on teaching oral rehydration therapy to parents and on advising about nutrition, sanitation and hand-washing.

Since 1976, an additional 1,600 village health workers, with only six weeks of training, have been working in another 298 health posts in 23 out of Nepal's 75 districts. Their main tasks are to begin building integrated health services, calling on the support of different government ministries where necessary. In practice, they are involved in malaria surveillance, maternal and child health care, oral rehydration therapy, health education, leprosy and tuberculosis treatment, minor first aid, family planning advice and assisting in the organisation of vaccination campaigns.

Although there are still many difficulties, and both the training and the back-up of the 1,600 village health workers could no doubt be improved, both of these primary health care approaches have rapidly shown their potential for improving health in Nepal. After only two years, a survey of four villages containing 6,000 households showed that infant deaths had fallen sharply. *In two villages covered by full time health workers in panchayat clinics, the infant mortality rate had been almost halved – from 123 to 65 per 1,000. In the two villages with village health workers, the mortality rate had fallen by a quarter – from 102 to 76 per 1,000.*

Commenting on the different impacts, the authors of the survey report pointed out that the health workers based at the *panchayat* clinics had been able to spend a considerable amount of time educating individual mothers about oral rehydration therapy. Village health workers, on the other hand, had to spread their time and effort over a much wider variety of tasks and over a much wider territory, meaning that less time was spent in supporting individual parents' efforts.

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consequence, for hundreds of millions of children, is that never in their lives will they fulfil their own potential. And the result of that, in turn, is to set up another self-perpetuating cycle of poverty whereby children who do not fulfil their potential for either mental or physical achievement are thereby condemned to remain in poverty and bring up their own children in circumstances where the cycle may well begin all over again.

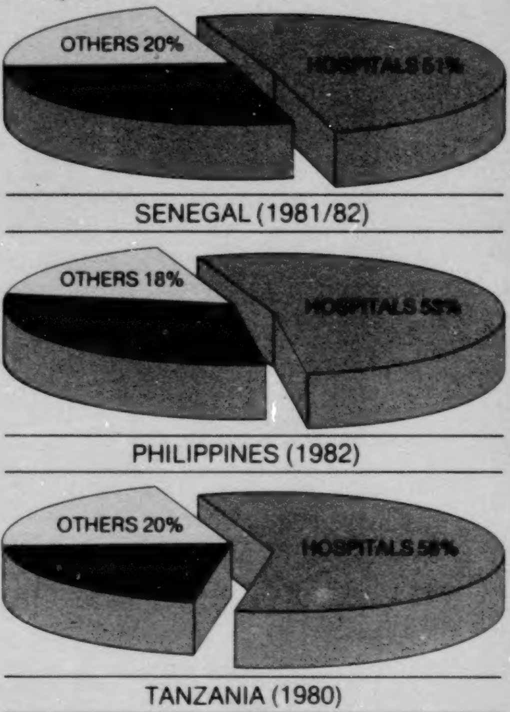
Nowhere have these inter-relationships been studied more intensively than in Narangwal, India, where the health of 35,000 people in 26 villages was studied by a team of 150 researchers over a four-year period. Its conclusion: '*It is now known that common infections precipitate malnutrition, which in turn reduces resistance. This facilitates further infections which again lead to increased nutritional deficit. If the sequence moves rapidly, the child dies – although neither malnutrition nor the infections by themselves would have caused death. When the sequence proceeds at a slower pace this combination is the major cause of chronic growth deficit, both physical and perhaps mental, in the more than 200 million deprived children in the world ... Nutritional deficits and associated lack of stimulation in early life interfere with both physical and mental growth. As a consequence, potential reduction through adult life in productivity and physical output represents a major limitation of human resources*'.*

These two inter-connecting and self-perpetuating cycles, the one linking malnutrition with infection and the other linking one generation's problems to the next, rank alongside economic injustice and inequality as major causes and perpetuators of poverty and under-development. Indeed, they are closely allied to that inequality. For as the Director-General of the World Health Organization has eloquently expressed it: '*Malnutrition is both one of the causes of social injustice and one of the factors contributing to its maintenance. It reduces the capacity to learn during childhood and to earn during adulthood. The inevitable result is a downward spiral in which poor malnourished parents produce malnourished children who in turn will become poor and malnourished parents*'.

For the sake of the physical and mental development of children, and for the sake of the social and economic development of societies, that original cycle of malnutrition and infection must therefore be broken. Somehow, parents must be empowered, by all possible means, to reduce the frequency and severity of setbacks to the normal healthy growth of their children during those first few years of life.

It is in this context, the context of improved child well-being as a lever as well as a consequence of development, that the low-cost interventions now available could indeed be revolutionary. And it is to those opportunities that this report now turns.

Fig. 1.7 Share of hospitals in health budgets



Source: *World Bank and WHO*

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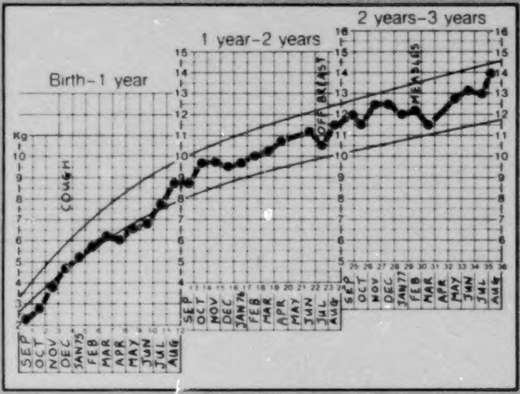
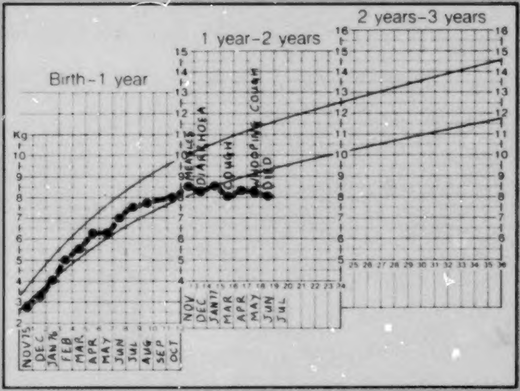
*From *The Narangwal Experience* currently being prepared for publication by the World Bank.

Growth Monitoring

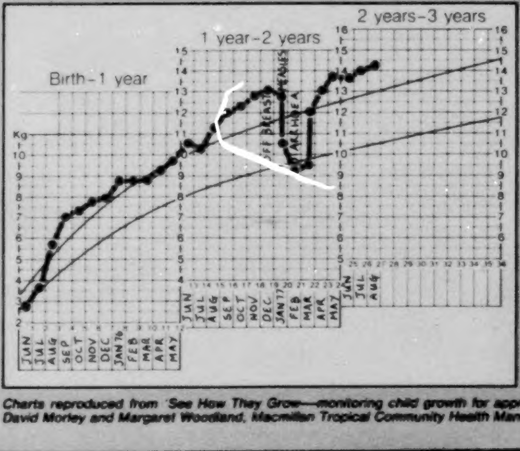


The charts shown here are reproduced from the actual growth charts of individual children. Around the edges of the charts—and on the reverse side—there are panels of advice on other aspects of child health—e.g. immunisation records and reminders, advice on when and how to use oral rehydration therapy, and messages about breastfeeding and weaning.

The child whose growth is depicted on this chart made good progress, despite set-backs at the time of coming off the breast and after a bout of measles. Weight loss was not allowed to continue once it had been detected by the chart.



This child—a boy—also grew quite well for a year. But then measles, diarrhoea, bronchitis and whooping cough struck in quick succession. With no time for recovery inbetween each bout of illness and weight loss, the sheer frequency of the set-backs finally proved too much and the boy died half-way through his second year. The cause of death was recorded as 'whooping cough'. But as the chart shows, the real cause was the *combination* of infection and malnutrition, each reinforcing the other.



This child progressed well until coming off the breast at about 18 months of age. Soon afterwards, she developed measles and lost more than a quarter of her body weight. Part of the weight loss was caused by dehydration. Without a growth chart, this serious set-back might have gone un-noticed. As it was, extra feeding helped a satisfactory recovery and a rapid making-up of growth.
(original chart in Spanish)

Charts reproduced from 'See How They Grow—monitoring child growth for appropriate health care in developing countries'—by David Morley and Margaret Woodland, Macmillan Tropical Community Health Manuals, 1979

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The Cutting Edge

Growth monitoring

Regular monthly weight gain is the most important single indicator of a child's normal healthy growth. But neither a mother nor a paediatrician can gauge that monthly growth by eye.

Only about 1% of the world's children are visibly and obviously malnourished. But more than a quarter of the developing world's children suffer from *invisible* malnutrition. And its very invisibility is one of the main barriers to its prevention or cure.

A detailed review of several hundred nutrition programmes conducted by the Harvard Institute for International Development, for example, recently concluded that: '*The average moderately malnourished child in the 6–24 month age range looks entirely normal but is too small for his or her age, has lowered resistance to infection, and therefore easily succumbs to illness. The child receiving only 60% of caloric requirement may give no outward sign of hunger beyond a frequent desire to breastfeed. In the Philippines study, 58% of the mothers of second and third-degree malnourished children said they thought their babies were growing and developing well*'.*

At the same time studies in several countries, including India, Pakistan, and Indonesia, have also shown that more than half of all cases of malnutrition are to be found in households where there is no absolute shortage of food. The reason why available food is not given to a malnourished child is usually that the mother does not know that her child is becoming malnourished and does not know that a child has special nutritional needs. And in many cases, the child's own appetite is depressed – often by the same illness which is causing the malnutrition.

Making the problem of malnutrition visible to the mother – the one person who cares most and can do most to prevent it – could therefore be one of the simplest but most important of all steps towards protecting and promoting the normal healthy growth of many millions of infants in those vulnerable early years.

For that task of making a child's nutritional status visible to the mother, an appropriate piece of technology already exists. Growth charts, costing less than 10 cents each, can show the mother whether or not her child is growing normally (see examples opposite). Regular monthly weighing and the entering up of the results on the chart reveal the vital information. And the accompanying message is simple: weight gain from one month to the next is good; weight constant is not good; weight loss is a serious danger signal.

Since they were first pioneered in West Africa by Dr. David Morley, growth-monitoring charts have been developed and refined in different regions of the world. Instead of being kept in the clinic by the health worker, many are now kept in the home by the mother. Instead of being printed on paper or card, some are now made of almost indestructible plastic. Instead of plotting the growth of each child against the curve of an average child, some charts now emphasise a normal *rate of growth* rather than a fixed idea of 'weight-for-age'. Instead of only recording weight and age, many charts also now show the dates on which a child should be immunized, record episodes of illness or clinic attendance, and carry advice about breastfeeding, weaning, family spacing and oral rehydration.

The main value of such charts is that they are practical and powerful educational tools for teaching mothers how to protect their child's healthy growth. With the chart, a mother can *see* progress or the lack of it, *see* the monthly weight gains or setbacks, *see* the downward falls from diarrhoeal infections and the upward jumps from extra feeding. The result of this visible symbol, this record and reminder, is the more informed involvement of the mother in the struggle for the health and growth of children:

○ In Indonesia, 2.5 million infants and young children are being regularly weighed at the traditional monthly meeting of village women — and the results are being entered on growth charts kept by the mothers themselves.

○ In Thailand, a programme based on the home use of growth charts by parents in several villages helped to completely eliminate third-

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*Nutrition Intervention in Developing Countries, Harvard Institute for International Development, Oelgeschlager, Gunn & Hain, Cambridge, Mass., 1981.

Indonesia: charting 2 million

10

Despite rapid economic growth over the last 15 years, Indonesia – the fifth most populous nation in the world – still has an infant mortality rate of around 100 per 1,000 live births and half of all deaths in the country are the deaths of children under five. One of the underlying causes is that approximately a third to a half of Indonesia's children suffer from malnutrition.

In 1981, it was decided to see whether the very successful family planning organisation – an organisation including 7,000 trained field-workers and a network of village family planning posts staffed by thousands of volunteers – could also be used to help expand the government's family nutrition improvement programme.

By mid-1982, all 7,000 family planning workers had been retrained and were starting to launch the nutrition programme in 15,000 new villages throughout Java and Bali. The programme set for itself two simple and measurable aims: first, all children under three should gain weight every month; second, all children should weigh at least 11.5 kilos by their third birthday.

The surveys which had shown that up to 50% of children were malnourished had also thrown up one other crucial fact. There was often no difference in household income or economic status between families whose children were malnourished and families whose children were growing normally. Therefore it was decided that absolute shortage of food was not always the main problem.

The centrepiece of the campaign was a rainbow-coloured growth chart, specially designed after intensive market research, which was given to the mothers of 2.5 million children in 15,000 villages on the densely populated islands of Java and Bali. It was this card which was to measure the progress of each child towards the two simple goals of the campaign.

Instead of institutionalising the programme in clinics, the traditional village *arisan* or mothers' meeting is used as the weighing point. With the common market-place scale, called the *dacin*, all children under three are weighed each month and the results entered up by the mother – sometimes with help – on her own child's chart. The charts themselves, cost approximately 5 cents. On the front cover is a picture of a middle-class Indonesian woman breastfeeding her baby. On the reverse side of the chart, panels contain information on how to make up oral rehydration salts and nutritious weaning foods.

But the main message of the chart is that monthly weight gain is good, constant weight is a warning sign, and weight loss is a danger sign.

In each village, the mothers themselves have selected *kaders* or nutrition volunteers who have then been specially trained by the family planning field workers.

Because the growth chart is kept in the home by the mother rather than in the clinic by the health worker, the means and the responsibility for 'good nutrition' are not taken away from the mother herself. And because the chart makes the child's nutritional level visible and intelligible to the mother, it is a powerful educational and communication channel for teaching mothers the relationship between food, illness, weight gain and health. Above all, the goals of the programme are understandable, measurable, and attainable.

Up to 2.5 million children are now being regularly weighed each month in Indonesia and the results are being regularly posted up on village notice-boards which show what percentage of the children have gained weight in the last month. From there, the information is fed into a computer in Jakarta which keeps track of the overall nutritional status of children. When the programme is evaluated later this year, it is hoped that malnutrition will have been reduced by up to 50%. By the end of 1984, the plan is to extend the family nutrition improvement programme to 40,000 out of Indonesia's 65,000 villages.

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degree malnutrition and reduce second degree malnutrition by 44% during 1981–82 – even though no additional food was provided.

○ In Colombia, improvements in weight gain for a majority of children suffering from mild, moderate, and severe malnutrition have been achieved in poor communities by nutrition programmes incorporating the 'Carnet de Salud' or 'Health Card' kept at home by mothers.

○ In Jamaica, a systematic programme to improve the health and growth of over 6,000 young children using growth charts, immunization, nutrition education, and milk supplements, has resulted in a 40% decline in the prevalence of malnutrition and a 60% fall in infant mortality.

In India, the Narangwal study cited earlier concluded that the '*worldwide experience with "road to health" cards for recording weight gain has been reinforced by experiences at Narangwal showing that it is possible to help mothers learn that a child with faltering growth is a sick child. Growth monitoring therefore served both as an educational device and as the principal entry point for active nutritional supplementation. It is our belief that the most important long-term impact from our nutrition programme was in the education of mothers. The nutrition problems in the Punjab result mainly from inappropriate feeding practices and the heavy load of infections. Our results showed that it is a fallacy to assume that if food supplies are sufficient in a village, people will solve their own nutrition problems. In most developing countries, just as important as improving food supplies is the need for a major effort to help mothers learn how to make better use of food. Much of the childhood malnutrition could be ameliorated by nutrients that are already available in the village*'.

However helpful they may be, there can be no pretence that growth charts will protect the growth of children in the homes of the unemployed and the landless where absolute shortage of food may well defeat any intervention which does not include food itself. But in the significant number of homes where food is available but where children are still malnourished, the more than 200 different kinds of growth chart now going into use in over 80 nations can be one of the most powerful of all 'technologies' for enabling parents to protect the healthy growth of their children.

Breastfeeding

For infants who are breastfed, the first six months after birth are often the healthiest time in their lives. Even in very poor villages, or in the slums of the cities, young infants are often sleek-limbed and shining with health. Collections of growth charts from different nations confirm this evidence-of-the-eyes and usually depict smooth and satisfactory growth until half-way through the first year of life.

More than anything else, this healthy start reflects the protection which breastfeeding offers to all infants. And it is no exaggeration to say that if breastfeeding were to be gradually replaced by milk-powders and feeding bottles among the low-income families of the developing world, then the battle to protect the normal physical and mental growth of the majority of the world's children would be lost (see Figure 1.9).

In recent years, a surge of research has shown that, as well as being more nutritious and hygienic, breastmilk also 'immunizes' the child and helps to fight off infection. Milk powders, by contrast, can be over-diluted with unclean water in an unsterilised feeding bottle which is often left to stand in the tropical heat. The result is that babies who are bottle-fed are many times more likely both to be malnourished *and* to contract infections – so setting up the cycle of malnutrition and infection at an even earlier and more vulnerable age. Some of the evidence:

○ In both India and Canada, separate studies have found that artificially fed infants were three times more likely to contract diarrhoeal infections and twice as likely to suffer from respiratory infections (the two main causes of child death) as infants who were breastfed.

○ In Chile, artificially fed infants have been found to be two-to-three times more likely to die in the first year of life.

○ In the Yemen Arab Republic bottle-fed infants have been found to be eight times more likely to be malnourished.

The Philippines: a hospital leads the way

11

Over the years, artificial feeding of babies had become accepted practice at Baguio General Hospital in the Philippines. New-borns were separated from their mothers at birth and fed with powdered milk in nurseries decorated with posters and calendars promoting various brands of infant formula. From time to time, representatives of the milk-powder companies came in to give a sales talk to the staff of the maternity wing and to restock the cupboards with free samples of milk powder for new mothers.

In April 1975, all that changed. Natividad Relucio-Clavano, Chief of Paediatrics at Baguio, returned to the Philippines after working for some time with Professor David Morley at London's Institute of Child Health. There she had become convinced that the decline of breastfeeding was one of the most serious threats to the health and lives of infants in the developing world.

'My training with Dr. Morley was a turning-point in my life,' says Dr. Clavano. 'I came back to the Philippines determined to start my own personal campaign for breastfeeding in Baguio City and the rest of the country.

'I closed the door to the milk companies. We stopped giving our babies the starter dose of infant formula. Down came the colourful posters: in their place we hung the "baby killer" posters which show an emaciated baby inside a dirty feeding-bottle.'

Instead of being separated in a nursery, new-born babies were 'roomed in' – given to their mothers almost straight away so that breastfeeding could begin immediately.

As soon as the new procedures for rooming in and breastfeeding were instituted in the hospital, there was a noticeable drop in infant illness. But when a formal study was made to evaluate the effects of the change, the results were nothing less than startling.

Through all this, the hospital staff itself had to be convinced. Strongly supported by the Chief of Obstetrics, Dr. Clavano began a campaign of educating doctors, nurses and medical students, stressing that breastmilk is more nutritious, more hygienic, contains immunological and anti-infective agents, and is cheaper for both mothers and health services. Without the money and space and staff time required for bottles, teats, mixing the powder and sterilising, the maternity wing could run more efficiently and give more attention to the mothers and babies.

Comparing 4,720 babies born during the two years before the change was made with 5,166 babies born during the two years after the change, it was found that the incidence of clinical infection had fallen by 88%, the incidence of diarrhoeal infection had fallen by 93%; and the incidence of infant deaths had fallen by 95%.

Over the whole four-year period, 67 babies died in the hospital. All but two had been bottle-fed. 38 of the babies who died were victims of diarrhoea : all had been bottle-fed.

Dr. Clavano is now working to make the eloquent message of Baguio heard across the Philippines.

Dr. Clavano writes about the Baguio experience in her essay on The Promotion of Breastfeeding (see pages 86 to 92).

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○ In Central and South America, studies in several countries have concluded that infants breastfed for less than six months (or not at all) were five-to-ten times more likely to die in the second six months of life than babies who were breastfed for six months or more.

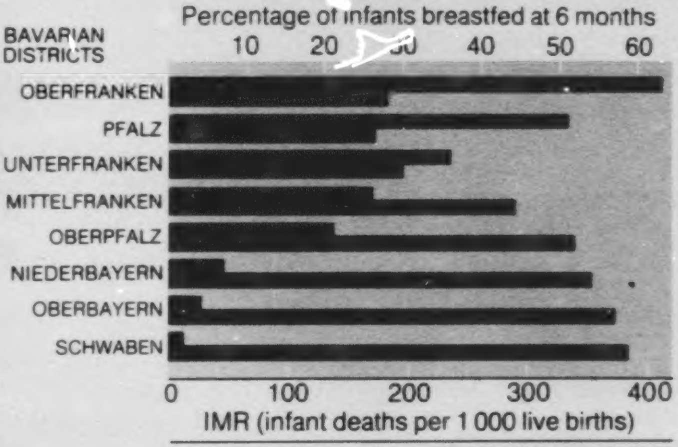
○ In the United States, a study in New York State has found that bottle-fed infants were hospitalised three times more frequently than breastfed infants during their first year of life.

○ In the Philippines, the decision to encourage breastfeeding instead of bottle-feeding of new-born babies at Baguio General Hospital reduced clinical infections by 88%, diarrhoeal infections by 93% and infant mortality by 95% (see panel No. 11).

○ In Papua New Guinea, severe malnutrition among the children of Port Moresby fell from 11% to 4% after a promotional campaign and a ban on over-the-counter sales of feeding bottles had increased the incidence of breastfeeding from 65% to 88% (see panel No. 2).

○ Surveying a total of 33 comparative studies of breast and bottle-feeding in different parts of the world, Dr. Anne Hill of the London School of Hygiene and Tropical Medicine has concluded that the risk of death in infancy was three times higher for 'mixed-fed' babies (both breast and bottle) and five times higher for babies who are exclusively bottle-fed.

Fig. 1.8 Infant deaths and breastfeeding, Bavaria, 19th century



Source: J.D. Wray. Feeding and Survival: Historical and Contemporary Studies of Infant Morbidity and Mortality. (Background paper prepared for WHO/UNICEF meeting on Infant and Child Feeding. 9-12 October 1978.)

Despite this avalanche of evidence, there are alarming signs that breastfeeding is declining in many parts of the developing world.

In Brazil, the proportion of babies being breastfed at the age of one month has fallen from almost 100% in 1940 to less than 20% in the relatively affluent south and to less than 5% in the city of Recife in the needy north-east. (These figures pre-date the recent and massive campaign to promote breastfeeding in Brazil). In South Korea, prolonged breastfeeding has fallen from 55% of first babies to 35% in 20 years. In urban areas of the Philippines, the percentage of mothers breastfeeding fell from around 80% in 1957 to less than 10% in 1977.

Adding this evidence of the decline in breastfeeding to the evidence of its clear advantages, shows a drastic and unnecessary increase in both malnutrition and infection for millions of the world's young children. Campaigns to defend and promote breastfeeding, and to stop the spread of artificial substitutes, are therefore an indispensable underpinning of a child health revolution.

Such campaigns are now gathering momentum. Since the adoption by the 1981 World Health Assembly of the 'International Code of Marketing of Breast-milk Substitutes',* over 100 nations of the world – including countries like Brazil and the Philippines where breastfeeding has declined steeply – have started the process of changing hospital practices, adopting marketing codes, and protecting infants from the threat of commercial baby-milk promotion. In eleven nations, all advertising of breastmilk substitutes to the public has been banned and in some the distribution of free samples of infant food in maternity hospitals has also been prohibited.

At the moment, it is not clear whether this battle to reverse the trend towards bottle feeding is being won or lost. But if the trend is to be arrested, and if breastfeeding is to play its part in the child health revolution, then the campaign to promote its advantages will need to take root in the community as well as in the health services.

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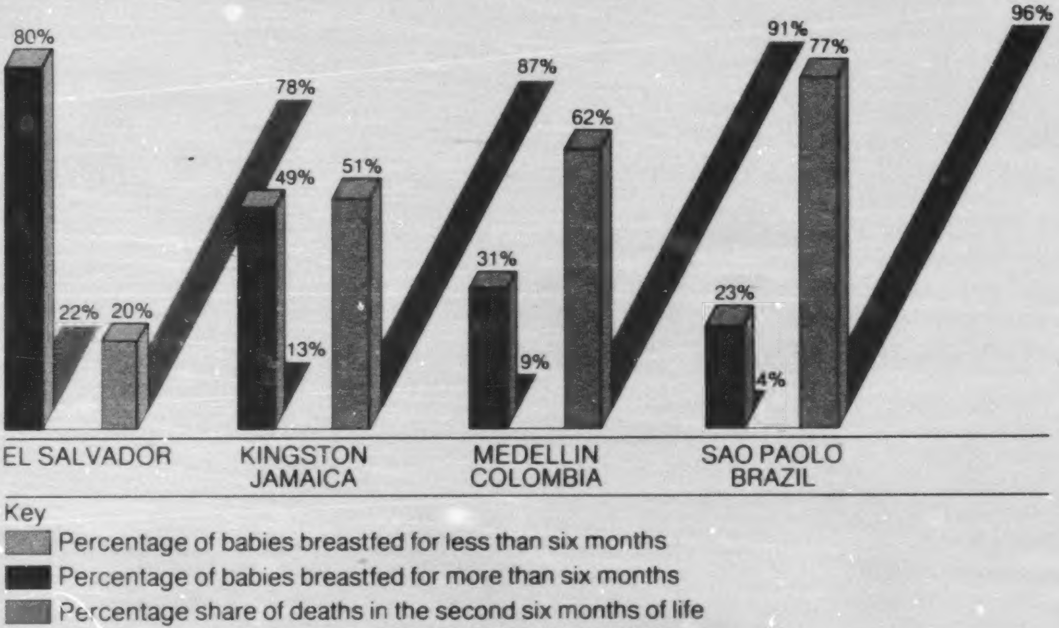
*The Code was drafted by WHO and UNICEF in consultation with concerned industrial, consumer, and professional bodies.

Present knowledge about the dangers of bottle-feeding should saturate every pore of the health services from paediatricians to paramedics, medical schools to maternity hospitals. But influential as these prestigious groups are, it is clear that the health services alone cannot give this campaign the outreach it now needs. Community groups, religious organisations, trade unions, the commercial community, women's associations, political parties, primary and secondary schools, the mass media, and other government services all have a part to play. In the Brazilian campaign, for example, the arguments in favour of breastfeeding have been put not just to all members of the health services but to all members of the public. In a 45-day information campaign all major newspapers, 100 TV stations, and 600 radio stations, took the message into almost every household in the country. Summaries of that same message also went out on bank statements, electricity bills, and even lottery tickets. At the same time, one and a half million pamphlets on breastfeeding were distributed to health centres and over 140 women's groups in six states launched educational campaigns. In the schools themselves, 15 states are now including information on breastfeeding in their regular curricula.

In the industrialised world, the recent and rapid return to breastfeeding – a movement which has usually been led by women in the higher-income and education groups – is to be welcomed both for the advantages it brings to children and for the influential example which it sets before the rest of the world. A little more than ten years ago, only about 30% of mothers in Northern Europe were breastfeeding their babies. In Sweden, Norway,

Fig. 1.9 Breastfeeding and child survival



Source: J.D. Wray, Feeding and Survival: Historical and Contemporary Studies of Infant Morbidity and Mortality (Background paper prepared for WHO/UNICEF meeting on Infant and Child Feeding, 9-12 October 1978.)

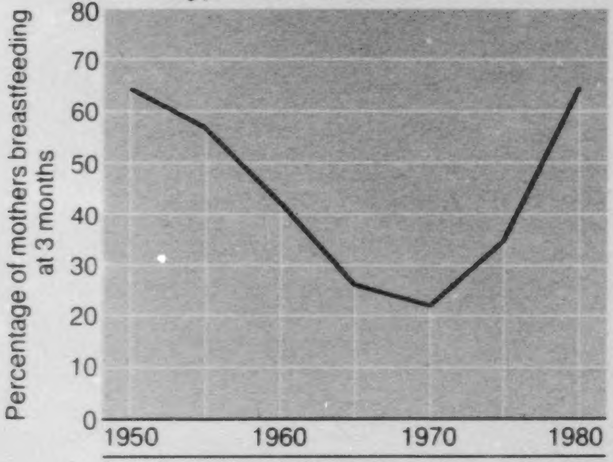
and Finland today, the figure has risen to over 90% (see Figure 1.10). Similar reversals are being recorded in many other nations including Australia, New Zealand, Denmark, France, Japan, Spain and the United States.

The reason for the return to breastfeeding in the industrialised world is the scientific discovery of its many advantages, the rapid communication of that knowledge to almost every family, and the equally rapid acceptance of that knowledge by more educated and better-informed mothers. Now, that same knowledge must be made available in the developing world – and among low-income families in the industrialised world – where millions of mothers are using breastmilk substitutes which they do not need, cannot afford, and are unable to safely use.

Often without clean water, or refrigeration, or sterilising equipment, or fuel and time for boiling, or enough money for adequate quantities of powder, or enough education to read the instructions on the tin, the poor communities of the world cannot afford to make the same mistake as the industrialised nations.

There is one element of this growing campaign which poses fundamental difficulties but which cannot under any circumstances be ignored. To advocate breastfeeding is to advocate that mothers be available to suckle their infants every few hours of every day of every month for a year or more and to do this for several children over several years. To ignore that fact would be to turn the campaign to promote breastfeeding into another example of society applying the pressure of expectation on women without offering them even the semblance of support. Therefore that campaign must also concern itself with the issues of paid maternity leave; job security during pregnancy and childbirth; facilities for child care and breastfeeding at the work-place; provision of nursing breaks without loss of pay; technologies to lighten women's work-loads; community education about the processes of pregnancy, lactation and weaning; and changes in hospital procedures.

Fig. 1.10 Breastfeeding in Oslo, Norway, 1950–1980



Source: Elisabet Helsing, Infant Feeding in Norway. A Preliminary Overview. Report to the WHO Regional Committee 1981. Oslo, 1981, p.2

Finally, the informed support of the community in general – and men in particular – could do much to improve maternal and child health by understanding and accepting the fact that pregnant and lactating women need to work less and eat more. Because it is the mother who does most of the work involved in bearing and caring for children, there is a tendency to talk about child health and growth as if it were the responsibility of the mother alone. But the truth is that few things could make such a significant improvement to the lives of women and children as men knowing more and doing more about the raising of their young.

Oral rehydration therapy

As the half-way point in the first year of life approaches, one of two evils begins to undermine the normal growth and weight-gain of tens of millions of the world's infants. The first is that the mother will not begin to give her baby other food in addition to breastmilk. The second is that she will.

From the age of five or six months, breastmilk alone is no longer sufficient to meet the needs of a growing child. If supplementary feeding is not now introduced, then growth slows down, weight-gain falters, and resistance falls. Not beginning to add supplementary foods at this time therefore

Barbados: promotion fails

12

In 1969 a national food and nutrition survey carried out in Barbados revealed that very few mothers were breastfeeding their young babies. Anxious to reverse this trend, the country's health professionals took action. Bottles were banned from the maternity wards of Queen Elizabeth Hospital, where more than 90% of Barbadian children are born, and so were the 'milk nurses' who promote bottle-feeding. Mothers and mothers-to-be were given intensive education about breastfeeding in health centres and clinics and through the mass media.

Twelve years later Barbados carried out another survey; the sample included 126 mothers with babies less than a year old, who were questioned about their views on infant feeding.

At first glance the stepped-up educational campaign seemed to have worked. More than 90% of the mothers interviewed in 1981 had made the decision to breastfeed before the baby was born, and 70% said they had been well briefed in prenatal clinics. Nearly 70% of them recognized the value of feeding during the initial colostrum period (as compared with only 30% of mothers in the 1969 survey). All in all, fully 85% of the mothers were convinced that breastfeeding was good for the child.

But when the questioning shifted from what the mothers *knew* to what the mothers *did*, a different and more disturbing story began to emerge. Only 45% of them were still breastfeeding at three months, and at six months the figure was less than 20%.

Clearly, something had gone wrong: nine out of ten mothers had planned to breastfeed, but fewer than two in ten were breastfeeding six months later. Barbados' labour legislation allows three months' maternity leave on half-pay, which should enable working mothers to breastfeed at least for those three months; but even at three months only half of the mothers who had meant to breastfeed were doing so.

Some clues to the paradox can be found in the mothers' situation at home. Nearly all of them were receiving child support from their baby's father, but only half of them were actually living with him. A breastfeeding mother needs to be readily available for her child, and this is not easily arranged when she has to run a household with insufficient assistance from a live-in husband or relative.

The difficulty worsens if she needs employment as well. Two out of five of the sample of Barbados mothers were employed; but not only did they have to return to work early (after only four to six weeks of leave), they also returned to work-places which did not encourage or even permit breastfeeding. Many of the remaining mothers, though not technically employed, were almost certainly doing some kind of work to eke out their income; they, too, were caught in a trap – between their wish to breastfeed and the need to work, in a social climate that does not look kindly on breastfeeding away from the home.

In the circumstances, it is no wonder that the mothers gave up. When they were questioned about it they said that they did not have enough milk (irregular feeding curtails the flow of breastmilk), and they said that they wanted their babies to get used to the bottle so they could easily be fed by others.

The children in Barbados lost out on the advantages of breastfeeding – not because their mothers lacked understanding, but because the support system that working mothers need was inadequate. Guaranteed, fully paid maternity leave, arrangements for home help, day-care centres or crèches near the work-place, nursing breaks at work – all these are also needed if working mothers are to be able to breastfeed their children.

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pushes the child towards the edge of the vortex of malnutrition and infection. Yet in many countries, including India and Bangladesh, more than a third of all infants are still being exclusively breastfed even at the age of one year or more. At that point, malnutrition is the certain result.

If, on the other hand, supplementary foods are introduced at the age of five or six months, then the risk of infection and malnutrition is almost as great. For as a child is weaned from the breast on to other food and drink, so it is weaned into increasing contact with an outside environment which may well include unsafe water, contaminated foodstuffs, unhygienic sanitation and uncontrolled infection. Weaned or unweaned therefore, it is at this point – mid-way through that first year – that so many millions of young children slip into the downward spiral.

To keep a child growing normally, there is no question that the introduction of supplementary foods must begin at this time. So help for the mother – help in weaning her child safely – is the next obvious fulcrum against which leverage for improvements in child health and growth can be exerted.

For most infants in most parts of the developing world, the greatest danger of the weaning period is the danger of dehydration induced by diarrhoeal infections. A study in the villages of Guatemala, for example, has shown that the incidence of diarrhoea increased sharply in the second six months of life and rose to become twice as likely in the second year as in the first.

To protect the child from diarrhoeal infection is a task which no mother can accomplish alone. For it involves an armoury of deterrents – health and nutrition education, more and better weaning mixes, more hygienic preparation and storage of food,* more water and safer sanitation, improved domestic and personal hygiene,** and immunizations against diarrhoea-inducing infections like measles.

Action on all of these fronts is obviously necessary – and not just for the prevention of diarrhoea. But in the meantime, dehydration continues to claim the lives – and strike at the growth – of millions of children in almost all communities of the developing world. Mothers therefore need help *now* if they are to protect the health and growth of their children through the vulnerable years. Thanks to one of the simplest but most important breakthroughs in the history of science, that help may now be at hand.

Diarrhoea itself is so common in the developing world – with an estimated 500 million children suffering the infection three or four times a year – that most parents regard it as just a normal part of growing up (see Figure 1.11). Normally, the infection cures itself in a matter of days, but in about 10% of all cases, something starts to go seriously wrong.

Perhaps feeding stops – the natural reaction of most mothers when a child has diarrhoea. Perhaps the child just won't eat – the appetite depressed by infection. Or perhaps the child's powers of recovery are already at a low ebb. Whatever the cause, the infection persists and the fluids continue to drain from the body. Soon, 5% of the child's body-weight is lost. Even now, most children will recover – though their growth will have received another serious setback. But for some, the diarrhoea continues.

In a matter of hours now, the child's skin begins to lose its resilience and the thirst becomes unbearable, though the child may not have the energy to express it. Without urgent treatment, 10% of body-weight is soon lost. Now shock sets in, and stupor. Blood pressure begins to drop. The pulse quickens. Within minutes the kidneys begin to malfunction. Acids build up in the body. Peripheral blood cells begin to collapse.

One out of every 20 children born into the developing world dies like this before reaching the age of five.

Until recently, the only effective treatment recommended for dehydration was the intrave-

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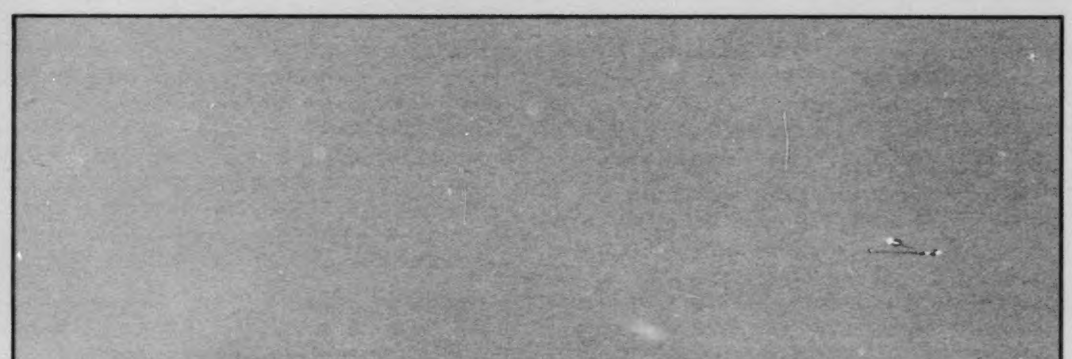
*Recent research findings challenge the conventional wisdom by suggesting that contaminated food is more important than contaminated water in the transmission of diarrhoeal disease.

**Studies have shown that more frequent hand-washing with soap and water after using the latrine and before handling food reduces the incidence of diarrhoeal infection by between 20% and 50%.



Nicaragua and Honduras: ORT cuts deaths

13

○ Because child diarrhoea and the malnutrition that goes hand in hand with it were such deadly scourges in Nicaragua, UNICEF's emergency assistance at the end of the civil war in July 1979 was concentrated on oral rehydration. Twenty-three oral rehydration units were established, with trained staff distributing oral rehydration salts free of charge and teaching mothers how to mix them at home. The units soon showed their effectiveness, and the emergency effort rapidly turned into a priority national programme.

The government used every available means to inform the public about oral rehydration. All the mass media were co-opted. The campaign was splashed across billboards, and leaflets, comic books, and posters were distributed nation-wide. The 80,000 young workers of the mass literacy campaign carried the message to every part of the country, along with the advice to continue feeding children during diarrhoea. Monthly reports from the oral rehydration units were widely circulated so as to dispel any doubts the medical profession might have.

By 1982 there were 334 units in operation, with a steady stream of child patients – more than 300,000 so far. *And diarrhoea has fallen from first to fifth place as a killer of Nicaragua's children.*

○ In Honduras, likewise, diarrhoea has traditionally been the foremost cause of infant and child mortality, and an intensive public information campaign has been mounted to combat it.

Radio was the principal channel for the Honduran campaign. One 60-second radio spot – a song extolling the benefits of breastfeeding – quickly became a national hit; it was always followed by an announcement urging the use of Litrosol, a locally-packaged brand of oral rehydration salts. Other radio spots, some of them humorous, covered related topics such as the importance of hygiene in preparing a child's food.

Distributed simultaneously with the radio campaign was a large poster of a mother breastfeeding her child, complete with rose, laurel and the campaign emblem of a red heart. Other eye-catching posters gave instructions on why and how to use Litrosol.

Mayors, midwives and health workers were given stocks of Litrosol packets and they raised flags outside their homes, displaying the red heart, to identify them as dispensers of the salts.

A year after the launching of the campaign the proportion of diarrhoea cases being treated with Litrosol rose from zero to 50%. Moreover, 95% of women surveyed after a year knew about Litrosol and how to use it. *In the most heartening finding of all, the death rate from diarrhoea in children under two fell by 40% within a year and a half.*

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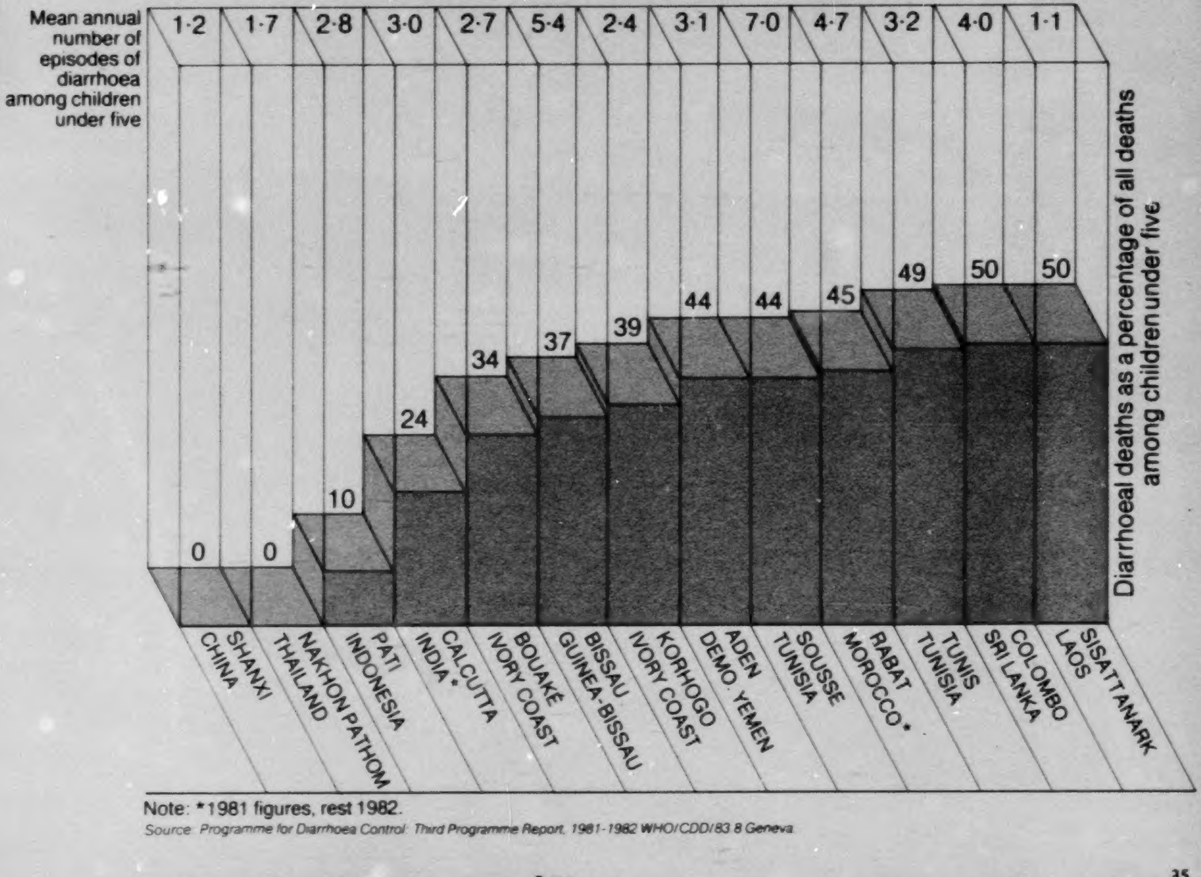
nous feeding of solutions administered by qualified personnel in medical institutions which were beyond the physical or financial reach of most mothers. Now the great majority of those 5 million dehydration deaths could be prevented by another breakthrough in the child health revolution – the use of oral rehydration therapy (ORT).

Attempts had often been made to rehydrate patients by mouth – usually by making them drink solutions of salt and water. But diarrhoeal infections not only increase the loss of fluids and salts from the body, they also inhibit the absorption of salts and water through the intestinal wall. Nonetheless it was the addition of sugar to such a salt and water solution, in an attempt to make it more drinkable, which led to the accidental discovery of oral rehydration therapy. For it was shown that the absorption of sucrose was not affected by the infection. And the sucrose carries salt and water through with it.

So by using glucose as a Trojan Horse to smuggle salt and water through the intestinal wall, oral rehydration was suddenly made possible. Mixed in the right proportions, the sugar can increase the body's absorption of the salt and water by twenty-five times. And by administering enough of the solution to replace fluids lost to the body during diarrhoea, dehydration can be pre-

Fig. 1.11 Child deaths from diarrhoeal infections



Note: *1981 figures, rest 1982.

Source: Programme for Diarrhoea Control: Third Programme Report, 1981-1982 WHO/CDD/83 8 Geneva

Bangladesh: healing at home

14

In Bangladesh, a quarter of a million children die each year from the dehydration and malnutrition linked to diarrhoeal infections. Most of them could be saved by simple oral therapy – if it were available.

The country's four factories for oral rehydration salts produce 2.5 million packets a year – as against an estimated need for 20 million. But even if production could be stepped up, three quarters of the population live beyond the reach of health services or drug stores and more than three quarters of all mothers would not be able to read the instructions on the backs of the packets.

To try to overcome these problems, 900 field-workers of the Bangladesh Rural Advancement Committee are now working in five of the country's twenty districts teaching 2.5 million women how to prepare a home-made version of oral rehydration salts using ingredients available in every household – salt and molasses. A three-finger pinch of salt (*lobon*) and a four-finger scoop of molasses (*gur*) dissolved in the right amount of water add up to an oral rehydration mixture which has been shown to be effective and is approved by the International Centre for Diarrhoeal Disease Research, Bangladesh, the world's leading institution for research into diarrhoeal disease.

Bringing this home-made solution to the villages remained the major hurdle. Travelling from their temporary quarters by foot, rickshaw and bicycle during the dry winter season, and by country boats during the monsoon, teams of oral rehydration workers go door to door in the villages, spending about 30–35 minutes with each mother and stressing the 'seven points' of successful treatment for childhood diarrhoea. Most important of all, mothers are taught that the attempt to 'dry up' the child by withholding food and drink – a natural reaction of parents the world over – is a mistake which increases the risks of dehydration and child death. Finally, the worker watches the mother as she makes up the life-saving solution of *lobon-gur*.

One month after the oral rehydration teachers have left the area, a small monitoring team surveys 5% of the households visited to collect samples of the home-made oral rehydration solution and to ask mothers how many of the seven points they can remember. So far, the surveys have found that 98% of the women can prepare the home mix correctly and over 90% remember all or almost all of the seven points.

One possible reason for this success is that the oral rehydration teachers are paid by results – 16 cents for every women who can remember all of the seven points, 8 cents for every women who can remember 'nearly all', and only 4 cents for a woman who can only remember 'some'. If any woman cannot make up a mixture of oral rehydration salts correctly, the health worker who taught her receives nothing at all.

Even though the campaign is usually preceded by talks with the village men and the traditional healers and leaders of the community, many of the women who know how to make the oral rehydration mix do not use the technique when a child actually falls ill with diarrhoea. According to some surveys, usage rates vary between 8% and 60%. 'The difficulty lies in persuading village mothers to believe that such a simple thing can save a child from dehydration,' says Dr. Rahman, manager of the oral therapy campaign.

In October 1983, the campaign went into its second phase with the aim of covering half the nation by 1986.

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vented or corrected in almost all cases. In the remote Teknaf region of Bangladesh, for example, a three-year study of over 30,000 cases of diarrhoeal infection has shown that 95% could be successfully treated by ORT.

Oral rehydration salts can be made up locally in health centres (see panel No. 1). Or with the right kind of community education programme, an almost equally effective mix can be made by mothers using ordinary domestic sugar and salt – supplying potassium in the form of bananas, plantains or papaya. Alternatively, the right proportions of salt and sugar, with small quantities of potassium and bicarbonate (to correct metabolic acidosis), can be made up and pre-packed in factories at a cost of less than 10 cents.

Whatever kind of oral rehydration method is used, the two vital messages for parents are:

○ Continue feeding even when your child has diarrhoea and ...

○ Begin replacing fluid losses by oral rehydration treatment as soon as the diarrhoea begins.

By this technology and these messages, most dehydration deaths can be prevented and growth can be maintained. Studies in the Philippines, for example, have shown that children treated with oral rehydration therapy during attacks of diarrhoea maintained monthly weight gain whereas children who did not have ORT available had lost weight as a result of diarrhoeal infections.

So much for the theory. Does ORT work in practice?

○ In Guatemala, child deaths have been reduced by half among a population of 64,000 people in the eastern region of the country after 'health promoters' began teaching mothers how to use locally-made packets of oral rehydration salts (see panel No. 1).

○ In Egypt, child deaths in the Nile village of Berket Ghatas have been reduced by 50% within a year of a community-backed oral rehydration campaign (see panel No. 7).

○ In India, a population of 18,000 people in thirteen villages of the Punjab has seen its infant mortality rates from diarrhoeal infections *halved* by ORT in less than two years.

○ In Costa Rica, child deaths from dehydration have dropped by more than 80% in hospitals since ORT was introduced and the hospital services have saved an estimated $3 million in the first year (see panel No. 15).

○ In Egypt, thousands of mothers have reduced the overall pre-school death rate from diarrhoeal diseases by 50% – using home-made salt and sugar solutions.

○ In Bangladesh, community-based distribution of oral rehydration salts in the village of Shamlapur (population 7,000) resulted in 80% of diarrhoea cases being treated with ORT and a fall in the death rate to 0.5% of all cases as opposed to 2.4% in comparable villages.

○ In India, death rates from diarrhoea in six villages fell to levels 80% lower than in nearby villages after health workers and community organisations began promoting locally-manufactured oral rehydration salts.

○ In Honduras, the number of diarrhoea deaths among children under the age of two has been almost halved by the use of ORT. One year after the beginning of an education campaign – backed by intensive radio coverage – 95% of mothers knew how to make and administer the salts (see panel No. 13).

○ In Trinidad and Tobago, child deaths from diarrhoeal infection dropped by 60% in the General Hospital, Port of Spain, in the five years after ORT replaced intravenous feeding as the main treatment for dehydration.

○ In Haiti, the diarrhoea death rate among children brought into the State University Hospital, Port-au-Prince, fell from 40% to 1% after ORT was introduced in 1980. Because the mothers themselves were taught ORT, each child benefited from 'intensive care' and earlier rehydration.

○ In Bangladesh, 900 field-workers have taught 2.5 million women how to make ORT solutions from the salt and molasses available in every household. Follow-up surveys have shown that more than 90% of the mothers can prepare an effective mix and a significant number are now using it (see panel No. 14).

○ In Nicaragua, 80,000 young literacy workers

Costa Rica: deaths down 70%

15

During the 1950s Costa Rica had one of the highest population growth rates in the world. Infant mortality was running at around 90 per 1,000 live births and diarrhoea and dehydration accounted for 10% to 15% of all deaths.

Some progress was made during the 1960s and the infant mortality rate was reduced to just over 60 per 1,000 by the end of the decade. But the most dramatic change in the health of the nation began with the putting into action of a 10-year plan in 1970 – a plan directly aimed at improving child health.

Complete reorganisation of the Ministry of Health and of the Costa Rican social security system was followed by a programme to extend primary health care to the entire population.

Within four years the programme was screening 125,000 children and had enrolled 10,000 pregnant women in pre-natal clinics. Soon, evidence of its success was coming in in the shape of falling death rates. Over the whole ten years of the plan, measles deaths fell by 97%, tetanus deaths by 96%, and whooping cough deaths by 75%. Polio and diphtheria were eradicated.

Hygiene education, the promotion of breast-feeding, and the spread of safe water and sanitation had significantly reduced the incidence of diarrhoeal infection. But for the children who did contract a diarrhoeal disease, the risk of death from dehydration was still unacceptably high. In the 1970s, oral rehydration therapy was introduced into Costa Rica's hospitals, backed by intravenous feeding for the most serious cases. Within a year, deaths from dehydration at the National Children's Hospital fell from 18 to two.

For most rural families, hospital treatment for dehydration was not available. So after trials in outpatient clinics, oral rehydration was taken out into the community in a campaign to teach parents to buy and use the sachets of oral rehydration salts in their own homes.

Again the results were dramatic. By 1980, there had been a 98% drop in the number of infants dying from diarrhoea and dehydration. Significantly, this major stride forward in child health also resulted in a huge financial saving. During 1977, the cost of consultations and hospital care for diarrhoea cases was estimated at $3.5 million. The cost of the whole oral rehydration programme for Costa Rica's 250,000 pre-school children was $232,000.

Costa Rica's comprehensive attack on its health problems was completed by the bringing in of the programme of social development and family assistance in 1975. Among the principal objectives was the construction of aqueducts and sewers to complement the provision of piped water which had been supplied to 98% of urban homes and 62% of rural homes by 1980. The accompanying programme of health and hygiene education continues to be promoted by television, radio, posters and the press – stressing the role of hygiene and hand-washing in preventing disease.

By the end of the ten-year plan, overall infant mortality in Costa Rica had been reduced by 70%. In the same period, the birth rate had dropped by 6%, with more widely practised child spacing also acting as a boost to maternal health and reducing the number of premature and low birth-weight babies. At the same time, illiteracy had been brought down to only 8% and life expectancy had been increased to over 70 years, putting Costa Rica on a par with a number of European countries.

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have carried the ORT message into thousands of households and 334 ORT units have been set up across the nation. From being the leading cause of child death in 1980, diarrhoeal infection had dropped to fifth place by 1982 (see panel No. 13).

○ In Jordan, 1,720 out of 1,732 cases of diarrhoea were successfully treated by ORT in the General Hospital of Amman.

○ In one area of Turkey, the number of cases of diarrhoeal infection which had to be referred to fully qualified doctors has fallen from 34% to 4% since Assistant Nurse Midwives began taking oral rehydration salts into village homes and teaching their use.

Such examples demonstrate the potential of ORT. Both in preventing infant deaths and in preventing frequent setbacks to normal healthy growth, the technique could play a major part in a child health revolution. And there are now signs that things are starting to move. Countries as diverse as Nicaragua, Haiti and Honduras have now launched ORT campaigns designed to put this breakthrough at the disposal of every family. In total, over 30 nations are now beginning ORT programmes and at least 20 are gearing up for large-scale factory production of oral rehydration salts (see Figure 1.12). UNICEF itself is producing over 20 million sachets a year for 87 nations and, together with the World Health Organization, we are assisting more than 20 countries to begin local manufacture. Brazil alone is preparing to produce 20 million sachets a year and Pakistan has stepped up its distribution of salts from one million sachets in 1982 to five million in 1983. In total, present annual production of oral rehydration salts is running at around 80 million sachets a year as against the billion or more which would be needed if the sachets were to be made available to all children at risk.

Fig. 1.12 Developing countries producing oral rehydration salts

REGION	COUNTRY
AFRICA	ETHIOPIA
	LESOTHO
	MOROCCO
	MOZAMBIQUE
	ZAMBIA
AMERICAS	ARGENTINA
	BRAZIL
	COLOMBIA
	COSTA RICA
	DOMINICAN REPUBLIC
	ECUADOR
	EL SALVADOR
	GUATEMALA
	HAITI
	HONDURAS
	PARAGUAY
	PERU
EASTERN MEDITERRANEAN	AFGHANISTAN
	EGYPT
	PAKISTAN
	SYRIAN ARAB REPUBLIC
	TUNISIA
SOUTH-EAST ASIA	BANGLADESH
	INDIA
	INDONESIA
	NEPAL
	SRI LANKA
	THAILAND
WESTERN PACIFIC	CHINA
	DEMOCRATIC KAMPUCHEA
	MALAYSIA
	PHILIPPINES
	REPUBLIC OF KOREA
	VIETNAM

Source: Programme for Diarrhoea Control: Third Programme Report, 1981-1982 WHO/CDD/83.8 Geneva.

But shortage of the salts themselves need not prevent the rapid spread of ORT. For if parents have the knowledge and the confidence to mix sugar and salt and water in the right proportions, then an almost equally effective oral rehydration solution can be administered in the child's own home. Although not quite as good as the prepackaged salts made according to the UNICEF and WHO recommended formula, this slight disadvantage is more than made up for if home preparation means that oral rehydration therapy can begin earlier. If the parents also know that they should keep on feeding the child throughout the illness and that the solution should be used to replace body losses as soon as the diarrhoea begins, then most of those 5 million child deaths per year could be prevented.

In all of this, the central challenge will remain the creation of support for ORT among the health professionals, understanding within the community and confidence among mothers (see panel No. 7). Several times, ORT campaigns have foundered because mothers who knew how to make an effective oral rehydration mixture did not have the confidence to use it when the time

Lesotho: doubling immunization

16

The small land-locked Kingdom of Lesotho, set on the highest part of the great plateau of southern Africa, is not an ideal setting for any immunization campaign. More than half of the population lives in almost inaccessible mountain villages and fewer than half of the mothers can read.

But after a polio epidemic in 1976, the government decided on a major push to build vaccination programmes into the country's maternal and child health services. Final plans were drawn up by 1978 and in 1980 health centres all over Lesotho began holding special clinics for vaccinations – followed up by health education and nutrition guidance for the mothers who had brought their children along.

To keep the campaign going, 12 teams of vaccinators travelled by Landrover and motorcycle from health clinic to health clinic, village to village, immunising children and checking the 'cold chain' which keeps the vaccines at the right temperature.

Among Basotho children, 115 out of every 1,000 die before the age of one and another 20–25 will not live beyond the age of five. The cause of death is often an infectious disease – made both more likely and more severe by malnutrition. With one of the worst soil-erosion problems in the world, barely 15% of Lesotho's surface is fit to grow crops. Unable to make a living from the land, more than half of the men have gone to work in the gold mines and collieries of South Africa, leaving their wives behind to fend as best they can for themselves and their children. Immunization – which also helps to prevent malnutrition and gives a child longer to recover between the different setbacks to growth – is one way to begin breaking the chains which constrain so many young lives.

Two years after the immunization programme began, at least two out of every five children between their first and second birthdays had been fully immunized against six of the most important killer diseases of childhood – measles, whooping cough, tetanus, diphtheria, tuberculosis and poliomyelitis.

Before the programme started in 1980, only one child in 20 was immunized against polio. In 1982, more than half of Lesotho's children had been given the full three doses of anti-polio vaccine. At the same time, the proportion of children vaccinated against diphtheria, whooping cough and tetanus also increased, from 37% to 56%. Against tuberculosis, protection doubled from 40% to 81% of all children.

In 1976, not a single child in Lesotho was immunized against the biggest child killer of all the immunizable diseases – measles. Today, half of the country's one-to-two-year-olds are protected.

The credit for the success of the immunization programme goes both to the maternal and child health staffs and vaccination teams, and to the thousands of Basotho women who, despite their 16-hour working days, absent menfolk, and heavy responsibilities, carried their children many miles for the protection of immunization. With the mothers' enthusiasm keeping up the pressure, the immunization campaign in Lesotho may yet achieve its aim of full protection for every child within the next three years.

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came (see panel No. 6). But once created, a parent's confidence in his or her own ability to bring about improvements in family health will probably not stop at ORT.

The campaign to promote the knowledge and use of oral rehydration therapy was given a major boost in June of 1983 when experts and practitioners from all over the world convened at the International Conference on ORT in Washington D.C. to share recent experiences and plan future strategies. The Conference (sponsored by US AID, WHO, UNICEF, and the International Centre for Diarrhoeal Disease Research, Bangladesh) reached a consensus on all the fundamental points – that diarrhoea is a major killer and debilitator of children; that ORT is a safe, affordable and effective therapy; that the right basic chemical composition of the salts is generally agreed upon; and that the challenge now is how to put the new technology at the disposal of all who need it. *'Much progress has been made'*, said Dr. Lincoln Chen in his summing up of the Conference's proceedings, *'much more needs to be done, and done soon. Oral rehydration therapy is increasingly capturing the imagination of the policy makers, the scientists, and the public.'*

Meanwhile, further advances in the therapy itself are still being made. In the last two years, the International Centre for Diarrhoeal Disease Research in Bangladesh (a pioneering institute which has been given substantial support by the United States Agency for International Development and by the United Nations Development Programme) has run successful field-trials with an oral rehydration solution based on ground-rice boiled into a thin soup with only a three-finger 'pinch' of salt added. Other cereals – all of which contain the necessary glucose – could be used in the same way. Even cheaper and more available than sucrose or sugar-based solutions, these cereal-based salts have even less risk of side effects and can shorten the duration of diarrhoeal infection. And even without the chicken or vegetables which can be added, they can help in the vital task of maintaining nutrition and protecting growth even through bouts of diarrhoeal infection.

Research is now needed to prove the viability of the cereal-based salts and to find and test the combinations of locally available ingredients from which effective oral rehydration solutions can be made. But the more difficult challenge is to put what is already known at the disposal of millions of families who need it. And just as glucose and salt are the two vital ingredients of the 'technological breakthrough', so support of the national community through all available means of communication and the rise of new kinds of local community development workers are the two vital ingredients in the 'social breakthrough' which is as necessary as the salts themselves if ORT is to play its part in a child health revolution. (See panel No. 7).

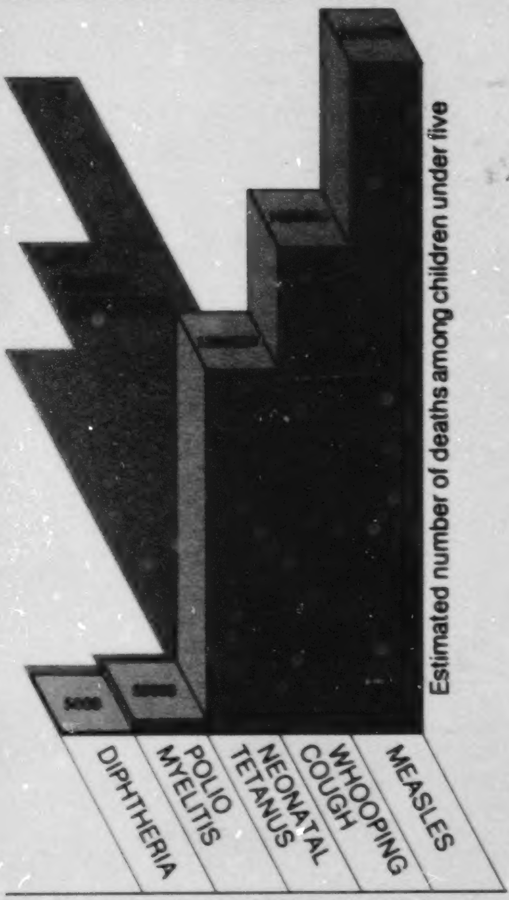
Expanded Immunization

Every six seconds, a child dies and another is disabled from a disease which can be immunized against (See Figure 1.13). Many more suffer setbacks to normal health and growth.

Immunization against the six major communicable diseases of childhood – measles, tetanus, whooping cough, diphtheria, poliomyelitis and tuberculosis – costs approximately $5 per child. Most of the $5 is for the delivery system – the vaccines themselves cost only 50 cents. To immunize every one of the 100 million children born each year in the developing world would therefore cost approximately $500 million a year. To compare the cost of such benefits with the cost of weapons of war has become a cliché of development literature. Yet it may perhaps bear pointing out that this sum of $500 million needed to prevent the deaths of five million children a year and the disability and malnutrition of many millions more is equivalent to the cost of only ten of today's most advanced fighter planes.

The case for a campaign to immunize every child does not need to be clothed in argument. The barest facts will do. But the role of immunization as a weapon in the child health revolution is even greater than the saving of the lives of 5 million children a year and the preventing of disability in the lives of 5 million more. All of the immunizable diseases – but especially measles and whooping cough – are also driving forces in that cycle of malnutrition and infection which sets back the growth of millions of those who survive the infections themselves.

Fig. 1.13 Total child deaths from immunizable diseases 1980



Note: No reliable estimates available for tuberculosis
Source: Based on WHO estimates

Measles, for example, was found in one African study to be the 'precipitating cause' in half the cases of hospitalisation for malnutrition. And as the growth-chart on page 24 shows, there is also a synergistic reaction between the different infections themselves. In the case of this particular child, it was measles and diarrhoea which set back the child so severely that there was no resistance left when whooping cough struck only a few weeks later. The formal death certificate simply said 'whooping cough'.

All infections are nutritional setbacks. Often, the climb back to normal weight and growth takes several weeks. Immunization against the six main infectious diseases of childhood would therefore be a partial 'immunization' against malnutrition itself. And it is because it strikes against infection *and* malnutrition that immunization is one of the sharpest tools for cutting into the vicious cycle and reducing the severity and frequency of setbacks to the normal development of the child in its most formative years.

Given the fact that immunization can play such a vital part in protecting healthy growth, and given the fact that the necessary vaccines have long been available at a very low cost, why is it that no more than 10% to 20% of the world's young children are now immunized? (See Figure 1.14).

At first sight, immunization would appear to be a relatively easy or 'clean' intervention: the process itself is quite simple; it produces dramatic results; it has the appeal of modernity without requiring any deep-seated changes in attitude or behaviour. Yet a second look reveals some less simple elements: only certain vaccines can be combined into the same 'shot'; immunity may require three separate visits; BCG (tuberculosis) injections should ideally be given at birth; anti-tetanus vaccine should be given to the mother in pregnancy; other injections should begin as soon as possible after the second month – except measles which should wait until the ninth month; and all of this has to be permuted into a plan to immunize 100 million children a year – every year – with vaccines which must be kept refrigerated from the day they are made almost to the day they are used.

Add to this poor transport and communications; illiteracy and scattered populations; the absence of electricity and the shortage of fuel; the scarcity of skilled manpower and the limited outreach of health services – and it becomes obvious that immunization is not as simple as it looks.

To compound the problem, probably a majority of uneducated parents are reluctant to bring their children three or four times for inoculations which may cause temporary fevers and restless nights. Until a recent intensive media campaign, many of the immunization units in Karachi, for example, were vaccinating only about ten children a day. In many countries, only a minority of all the children born are brought for the first injection, only half of those turn up for the second, and only half of those come for the third – thereby missing out not only on complete DPT protection (against diphtheria, pertussis and tetanus) but also on the vital measles injection which is often administered during that third visit. The education and involvement of parents is therefore a greater challenge than the technology of vaccines or the financing of immunization campaigns.

In the face of all these difficulties, but with the momentum of the successful eradication of smallpox behind it, the World Health Organization launched its Expanded Programme of Immunization (EPI) in 1977 with the aim of assisting all nations to immunize all children against all six diseases by 1990.*

At about the half-way point, there are many impressive achievements. More than 130 places in the developing world have so far launched their own expanded programmes of immunization. World-wide more than 1,000 senior national and international EPI staff and 10,000 middle-level managers have been trained. Many countries – including Brazil, the Congo, Gambia, India, Kenya, Lesotho, Malawi, Mozambique, Oman, Sierra Leone, Sri Lanka, Tanzania and Thailand – have made significant progress.

But overall, less than 20% of the children born this year into the developing world will be protected by immunization. And the target of immunizing all children by 1990 is not now going to be even nearly met unless there is a sudden surge of acceleration towards it.

Technological breakthroughs are becoming available to make that re-acceleration easier. New vaccines can retain their potency for longer periods and at higher temperatures. Solar-powered refrigerators, colour-change temperature warnings, and low-cost sterilisation techniques are all now undergoing trials. But the great barriers to be overcome are no longer technological. The problems which stand in the way of immunizing all children are the problems of parental education and community involvement, money and management, organisation and training.

To solve such problems, immunization campaigns usually need to be integrated into other primary health care and community development networks which can provide *continuity of contact* between people and immunization services.

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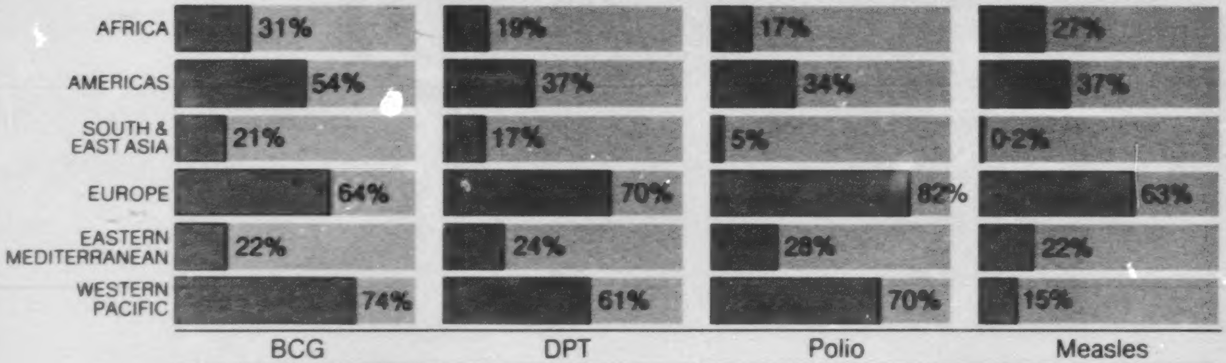
*UNICEF itself works closely with WHO in this programme and is the world's largest supplier of vaccines and 'cold chain' equipment.

Fig. 1.14 Percentage of children immunized in the first year of life



Note: DPT = Diphtheria, Pertussis (Whooping cough) and Tetanus

Source: WHO Expanded Programme on Immunization Global Advisory Committee Meeting October 1982

17

Malawi: measles down 60%

The people of Malawi suffer from poor health even by the standards of their neighbours in south-east Africa. The leading cause of sickness among children is malaria, followed by respiratory and diarrhoeal diseases. The main cause of child deaths, however, is measles (over 18 per cent of all inpatient deaths in 1979), trailed by pneumonia, malaria and nutritional deficiencies. Besides being especially vulnerable to all these illnesses, young children also have whooping cough to contend with. Chronic malnutrition adds to their burden and reduces their chances of survival, especially during January and February when food stocks run low and the rains may bring on yet more diarrhoeal diseases.

Protection against infectious diseases is accordingly a high priority in Malawi's maternal and child health care programme, set up in 1975. Immunizations are part of the routine duties of the clinic nurses and mobile teams which serve most of the country. In addition, special mini-campaigns are conducted against measles wherever the disease breaks out.

The childhood immunization programme was evaluated in early 1983 and found to have registered remarkably good results. Just over half of the children in the sample had been fully immunized against the principal infectious diseases of childhood. More precisely, 60% had been fully vaccinated against diphtheria, pertussis (whooping cough) and tetanus, and 72 per cent had been fully immunized against polio. Eighty-six per cent of the children had been protected against tuberculosis and 60% had received measles shots.

Even though the coverage is not yet complete, immunization has made its mark on the incidence of disease in Malawi. The number of outpatient referrals for whooping cough, for example, went down from 27,595 in 1978 to 18,627 in 1981, and referrals for measles fell from 246,511 in 1978 to 84,610 in 1981.

These figures have been achieved in the face of considerable obstacles. Recent shortages of fuel and transport, for instance, have meant that the mobile teams could hold mother-and-child clinics only once a month, or sometimes not at all, instead of twice a month as planned. For the same reasons, vaccines and supplies have not always been available either of late. The evaluators found, for example, that around a third of the health units they visited had no polio vaccine and a fifth had no tuberculosis vaccine. Some units also needed thermometers, and kerosene and spare parts for refrigerators.

Since the success of an immunization programme depends on its being accepted by the public, the campaign also monitored parental awareness of the need for immunization. They found that 80% of young mothers with children under three, selected at random, could define immunization and its purpose. They also knew which were the target illnesses and were able to give details of most of them: 89% could describe the symptoms of measles, 81% whooping cough, 75% polio, and 62% tuberculosis. Nine out of ten mothers understood which immunizations their children had received, and all of them knew that they had to return for more.

The credit for their being so well informed must go largely to the staff of Malawi's mother and child health care programme. A quarter of the mothers had obtained their information from friends, husbands and parents, but fully two thirds of them had received their education in immunization from health staff, mostly at ante-natal clinics.

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Unlike smallpox, which could be eradicated because humans were its only carriers, diseases like tetanus, whose spores are carried in the earth itself, cannot be eradicated. The challenge of immunization programmes is therefore not the challenge only of the one-off mass campaign but the double challenge of building a permanent system capable of delivering vaccines to every infant every year and of educating every new generation of parents about the need to bring their infants for the full course of injections.

To meet that challenge will mean mounting much more intensive and extensive campaigns to involve and inform communities and families about the demands which they must make of immunization services and the demands which immunization services must make of them. The chances of all children being present at the right times and the right places three times a year every year are considerably enhanced in communities which understand the reasons for this schedule and are involved in planning the how and the where and the when. So even for the 'clean intervention' of immunization, social and organisational breakthroughs – and community education – are as important as technological progress if immunization is to play its potentially decisive role in a child health revolution.

Money is important. The present annual investment of $72 million needs to be more than quadrupled over the next six years if the 1990 target for universal immunization is to be met. At the moment, 80% of the money is coming from the developing countries themselves.

But more important still is the mass mobilisation and the involvement of every possible means of communication in order to bring all parents to the point where they demand immunization for their children and understand that they must complete the full course of injections.

Synergisms

The four strategies discussed so far – growth monitoring, the promotion of breastfeeding, oral rehydration therapy, and expanded immunization – are strategies which are in a class of their own at the present time. They are low-cost. They are available now. They are almost universally relevant. And they achieve rapid results.

More than that, such actions carry the flag for primary health care itself. They reverse the usual relationship between doctor and patient by using knowledge and technology to empower rather than alienate those whom they are designed to serve. Rather than making people passive and dependent recipients of health care, they enable people to become informed activists in the protection of their own and their families' well-being. And in so doing, they promote the cause of self-reliance and people's participation in health.

Most important of all, these four simple actions are aimed at the heart of the world's major child health problem – the synergistic alliance of malnutrition and infection which now attacks hundreds of millions of our young children during the most vital years of mental and physical growth.

So far, the four strategies have been discussed individually. But just as malnutrition and infection join in a synergistic alliance to attack the health and growth of young children, so the different strategies ranged against them can also act in concert to defeat that alliance. A breastfed child or an immunized child is less likely to contract diarrhoeal infections; a child with fewer episodes of diarrhoea is less likely to be malnourished; a child who is less malnourished is less likely to contract infections. And every infection and weight loss prevented – whether it be prevented by immunization or breastfeeding or ORT or by careful monitoring of growth – makes another break in the cycle, puts more space in between setbacks, allows more time for recovery, and makes subsequent infection or weight loss a little less likely. In short, the combined impact of these four principal strategies can be considerably greater than the sum of their individual contributions.

The combined potential of these breakthroughs for child survival and growth is today very similar to the potential which high-yielding varieties (HYVs) of wheat and rice held for world food supplies in the late 1950s and early 1960s. At that time, doubling and even trebling the yields of first wheat and then rice became scientifically possible.

China: overcoming the odds

18

Over the past 34 years, the People's Republic of China has demonstrated on a massive scale that great strides forward in health need not wait upon advanced levels of economic development. With an estimated GNP of only $300 per person per year, China is still among the world's poorest nations. Yet its infant mortality rate is among the very lowest in the developing world. More than on technology or money, that achievement has depended on political commitment and social organisation.

By contrast, the *Beijing Review* reported in 1981 that such scourges as plague and [illegible] had been virtually wiped out. The incidence of malaria and schistosomiasis had been sharply reduced, and cases of polio had fallen to just over one per 100,000 population. Tuberculosis, the leading cause of death in pre-liberation China, killed an estimated 200 people per 100,000 population a year; in 1975, largely as a result of immunizations, it carried a mortality rate of [illegible]3 per 100,000 and had moved to ninth place as a cause of death.

In Tianjin, the country's third largest city, the reduction of childhood diseases between 1950 and 1978 ranged from 75% for measles to nearly 100% for diphtheria.

China has waged its battle against these diseases almost entirely without the technology normally considered a prerequisite to immunisation.

A particular problem has been the lack of electricity or equipment to keep polio and measles vaccines at the necessary low temperatures. As recently as September 1982, a WHO mission noted that none of the health facilities it visited in Hubei province had refrigerators. But solutions have generally been found, whether it has meant transporting children *en masse* to the nearest health centre with a refrigerator or taking advantage of China's freezing winters to run polio campaigns.

Immunization has been only a part, albeit an integral one, of China's health policy since 1950. Despite some shifts in approach, this policy has never wavered from the principle that preventive care should take precedence over curative services – a traditional tenet of Chinese medicine.

In the 1950s and early 1960s this principle took shape primarily in massive campaigns against such major health problems as schistosomiasis, malaria, venereal diseases and the 'four pests' (flies, mosquitoes, rats and bedbugs). Epidemic prevention centres were set up to mount equally energetic immunization drives.

The years after 1965 brought a new emphasis on decentralisation and on the provision of health care in the countryside, home of some 850 million of China's billion inhabitants. The main responsibility for immunizations shifted to the barefoot doctors, the paramedics who are probably the best-known feature of China's health system. Working in the production brigades or in the factories and neighbourhood health stations of the cities, the barefoot doctors have ensured that most of the country's population receives at least the basic elements of health care.

China's achievements in infectious disease control should not be considered in isolation: policies of full employment, a guaranteed food supply and a high level of literacy have all played a vital part. But its immunization record does suggest that technological shortcomings need not be a major stumbling-block, provided that a country is wholeheartedly committed to protecting its children from disease.

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But the power of the discovery was only a *potential power* because the HYVs needed the widespread availability of fertiliser, pesticides, controlled irrigation, and thousands of agricultural extension workers to train farmers in the management of the new seeds. In the late 1950s, hardly any of these essential ingredients of the Green Revolution existed on any significant scale in the low-income countries. As with the possibility of a children's revolution today, breakthroughs in organisation were needed to liberate the potential of breakthroughs in knowledge and technique.

By the mid-1960s, an explosion of training, tube-well drilling, and fertiliser use, especially in Asia, had begun to liberate this potential. Suddenly, the new seeds were doubling and trebling yields not in the demonstration zones of scientists but in the fields of farmers.

The organisational process by which the technological breakthrough of HYVs was translated into huge harvests holds many lessons for the present task of translating the potential of such breakthroughs as oral rehydration therapy into improvements in the health and well-being of children. First of all, it was noticeable that in every case where the potential of HYVs was fulfilled on a significant scale and in a short period of time, the mainspring of the achievement was the commitment of national governments at the highest levels. In India, Pakistan, the Philippines, and Turkey, for example, Heads of State or senior ministers personally took charge of the task. Principally because of this commitment, it became possible to mobilise the other ministries and government departments whose involvement was needed to make the Green Revolution happen. And it is this mobilisation at different levels and across different sectors of a nation's life which is the second important lesson to be learned from the experience of liberating the technological breakthrough of high-yielding seeds. For the management of this achievement was not the exclusive preserve of the Ministry of Agriculture. Ministries of Finance were involved in arranging the foreign exchange to buy vast quantities of fertilisers and pesticides; Ministries of Transport were involved in the problems of conveying both inputs and the doubled and trebled outputs which were the result; Ministries of Commerce were involved in arranging credit for thousands of farmers to invest in the process. Ministries of Information helped to spread the word about the revolutionary potential of HYVs. And important as they were to the Green Revolution, Ministries of Agriculture could not have achieved all this alone – any more than Ministries of Health alone can bring about a child health revolution today.

Finally, the Green Revolution offers the moral of mass mobilisation. Millions of farmers had to be reached, informed, given credit, persuaded, and backed up by technical expertise. Mass-media interest played a big part in communicating the potential of the breakthrough and farmers' associations of all kinds were deeply involved. At the same time, thousands of agricultural extension workers were recruited and trained for the task of communicating to farmers precisely how the new seeds were to be managed.

Political commitment at the highest levels of government; the involvement of all relevant ministries; the bringing together of a complex but mutually reinforcing 'package' of training, financing, education and transport and an equivalent technological 'package' of seeds, fertiliser, pesticides and irrigation; and the mobilisation of every available means of linking the breakthrough in knowledge to those whose lives could be improved by it – these are the lessons which the experience of the Green Revolution offers to the present potential for an even more important revolution in the survival and healthy growth of children.

After reading of the potential of child growth-monitoring charts in last year's *State of the World's Children* report, for example, the Chief Minister of Kashmir contacted UNICEF's Regional Office in New Delhi to ask for assistance in procuring one million growth charts. Discussions followed about how to bring a 'package' together to bring out the potential of the chart: how to provide scales calibrated in the same way as the charts; how to advise mothers on breastfeeding and weaning; how to provide supplementary food for the poorest households; how to introduce oral rehydration therapy and immunization cam-

19

Colombia: small is saveable

The normal weight for a baby at birth is about 3 kilos. Anything below 2.5 kilos is considered 'low birth-weight' and the lower the weight the greater the risk to the infant's health and life. Of babies born below I kilo, for example, nine out of every ten will die in their first month. Even at 2 kilos, the risk to life is approximately ten times greater than for babies of normal weight at birth.

World-wide, more than 20 million low-birth-weight babies are born each year and almost a third of them die before reaching the age of one. The incubators and intensive care which are often needed to save them are only found in modern hospitals and are therefore not available to the vast majority of low-birth-weight babies who are born to very poor mothers.

Now, a revolutionary technique pioneered by San Juan de Dios Hospital, in Bogota, offers life-saving 'intensive care' to all low-birth-weight babies who need it whether they are born in a hospital or not. The new technique needs no technology. Its cost is zero. And it is based on breastfeeding.

Under the leadership of Dr. Edgar Rey, a team of Colombian paediatricians have begun introducing new procedures for low-birth-weight babies in the hospital's Mother and Child Institute. Instead of being placed in incubators, low-birth-weight babies are 'packed' close to their mothers – under the blouse or sweater right next to the breast. There the baby's temperature (a major problem with very low-birth-weight babies) is regulated by the mother's own body. And instead of bottle-feeding in a separate nursery – or being taken out of the incubator and breastfed only every few hours (another problem with low-birth-weight babies is that they often can't suckle for very long at a time) – the 'packed' baby can feed in small amounts as often as it likes.

The baby thus gains all the advantages that breastfeeding can provide – the best nutrition, immunity from infection, freedom from both diarrhoea and constipation, and the affection fostered by the closeness between mother and child. If the mother doesn't have enough milk, the baby is given guava juice with sugar and water – never a commercial milk substitute.

The Colombian team then took an even more unconventional step. As long as the baby is healthy, mother and child are sent home from the hospital as soon as possible – regardless of the baby's weight.

Overall, the results have been dramatic. Before the new techniques were introduced, all babies weighing less than 1 kilo died. Now, three quarters of them are being saved. And for those weighing between 1 and 1.5 kilos at birth, the death rate has dropped from 70% to only 10%.

At the moment, what has been learnt at San Juan de Dios Hospital is of benefit to only a small number of mothers. But because it is based not on expensive technology but on empowering mothers to save lives, it is a breakthrough with the potential to reach out and save children's lives in the poor communities of Bogota, and beyond.

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paigns; how to work towards other basic services; and how to go about collecting data for nutritional surveillance and early warning.

Without the 'package' of organisational and technological synergisms, the full potential of these breakthroughs in knowledge and technique would not be realised. Without the commitment of a political leader who could mobilise different departments of government, the 'package' would not be possible.

The Mother of Change

If progress for children is to be accelerated despite difficult economic times, then the campaign for more resources for development has to be combined with a search for ways to improve the ratio between resources and results. Four such ways have already been discussed. But recent research in the developing world is also highlighting three more sets of changes which, though deeper-seated – and therefore more difficult and more costly – are of such potential significance for the health and well-being of the world's children that they must also now be counted among the breakthroughs in knowledge which make possible a child health revolution. Indeed so powerful are these levers for increasing child well-being that their effective incorporation into national child survival strategies could reduce child deaths and child disabilities by two-thirds within ten or fifteen years.

All three of these changes – in quite different ways – imply the further empowering of women.

Food supplements

One of the least-known but most important facts about infant deaths in the developing world is that the 10% – 15% of babies who are born with low birth-weights (below 2,500 grams) account for between 30% and 40% of all deaths in the first year of life. In other words, low-birth-weight babies are approximately three times more likely to die in infancy (see Figure 1.16). Among those who survive, low birth-weight has also been shown to be associated with longer and more frequent illnesses and with mental and physical impairments.

Reducing the incidence of low birth-weights, if it could be done, would therefore be a breakthrough of enormous significance for child survival and child health.

In the industrialised world, low-birth-weight babies are usually premature babies. In the developing world, low-birth-weight babies are usually 'full-term' babies; the reason their birth-weight is low is that they have been malnourished in the womb. And one of the main reasons for that is that the mother herself has been malnourished in her pregnancy.

On a subject of such obvious importance to the health of the world's children – and women – it is astonishing that there should be so little research. But the one major study of an attempt to prevent low birth-weights – by preventing malnutrition in the womb – has shown that it is possible and possible at a relatively low cost. In doing so, it has put another potentially powerful weapon at the disposal of a child health revolution.

The study, undertaken by the Institute of Nutrition of Central America and Panama (INCAP) in four villages in eastern Guatemala, showed that a food supplement of only a few hundred calories a day – given to women in the last three months of pregnancy – could reduce the incidence of low birth-weight from over 30% to only 4% or 5% and associated infant deaths by more than 50% (see Figure 1.15).

One other study, in India, has also shown that birth-weights can be significantly raised by an average of 300 grams through a daily supplement of 500 calories and 10 grams of protein for women in the last three months of pregnancy. A similar study, also in India, concluded that iron, folic acid, and food supplements for pregnant women were the single most cost-effective means of reducing peri-natal mortality among infants.

Even though we are now talking about extra food for the poorest mothers – rather than any general food subsidy – food supplements have a reputation for being both expensive and inefficient. Both accusations arise from the difficulties – and the costs – of actually targeting such supplements to those who are most in need. In one case in Colombia, for example, the provision of an 850 calorie-a-day food supplement to pregnant women only achieved an increase of about 130 calories a day in the actual intake of the women themselves. The reason was that much of the extra food went to other members of the family or was used in the place of food which would normally have been bought. But given the potential benefit of food supplements to the health of the mothers and children in greatest need, these problems cannot be regarded as insuperable. And once again it is the combination of scientific and social progress which now offers a way forward.

Scientific research has made its contribution to cost-effectiveness by making it possible to predict the low birth-weight risk even quite early in pregnancy. Women who weigh less than 90% of a woman's normal weight-for-height at the onset of pregnancy, or who have an upper arm circumference of less than 23.5 cm, or who fail to gain 1.5 kg. a month in the last 3 months, or who are over 35 years old, or who have had 4 or more pregnancies, or who have previously given birth to low-birth-weight babies, or who are anaemic, or who have placental malaria – would all be candidates for food supplements both to improve the health of the mother and to reduce the risk of low-birth-weight babies.

Social progress – in the increasing number of community development organisations, primary health care services, paraprofessional development workers, rising literacy and new communication channels – can translate that theoretical knowledge into practical benefits. A community development worker with a simple arm-circumference measuring band, for example, can identify women most at-risk. If the community itself is also involved and informed, then the special needs of the most vulnerable groups are more likely to be understood and the supplementary food made available *for* them is more likely to be consumed *by* them.

For the poorest mothers, that food supplement in pregnancy not only reduces the risk of low birth-weight but also builds up the 'energy bank' which a woman needs to breastfeed her baby without depleting her own body. If that supplementary feeding for women at-risk can continue at about the same level (approximately 500–600 calories per day) after the birth itself, then the quality and quantity of breastmilk can be maintained for a longer period of time – so extending the vital protection which breastfeeding affords to child health and growth in those vital early months.*

Finally, food supplements may also be necessary at the time of weaning itself – the time when so many millions of children slip into that downward spiral of malnutrition and infection.

For perhaps one third or more of the children in poor communities of the developing world, the absolute shortage of food in the house is the main cause of malnutrition. For such children, normal growth is almost impossible. Breastfeeding may protect them for the first few months. Oral rehydration therapy may prevent them from losing weight or dying of dehydration. Immunization may save them from some infections. Growth charts may inform their mothers that something is wrong. Health workers may advise on what can be done. But without enough of the right kind of food when weaning begins, growth cannot be normal, resistance cannot be kept up, and impairment of the child's development cannot be prevented.

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*Maternal malnutrition does affect the duration, quantity and quality of breastmilk – in that order. But even for the babies of malnourished mothers, breastmilk is still better than any artificial substitute. In Sri Lanka, for example, a study of four-to-eight-month-old infants born to poorly-nourished mothers showed that 76% of breastfed babies and only 29% of artificially fed babies gained 90% of normal weight-for-age.

For such families, extra food in the house is therefore an indispensable part of any strategy to protect the normal healthy growth of children.

The reason for the lack of food in the house is either the lack of money to buy food, or the lack of a large enough plot to grow food, or the lack of the means to make land produce food. And the solution to these problem will require, above all else, agricultural reforms, land tenure changes, more training and credit for small farmers, and increasing employment for poor people.

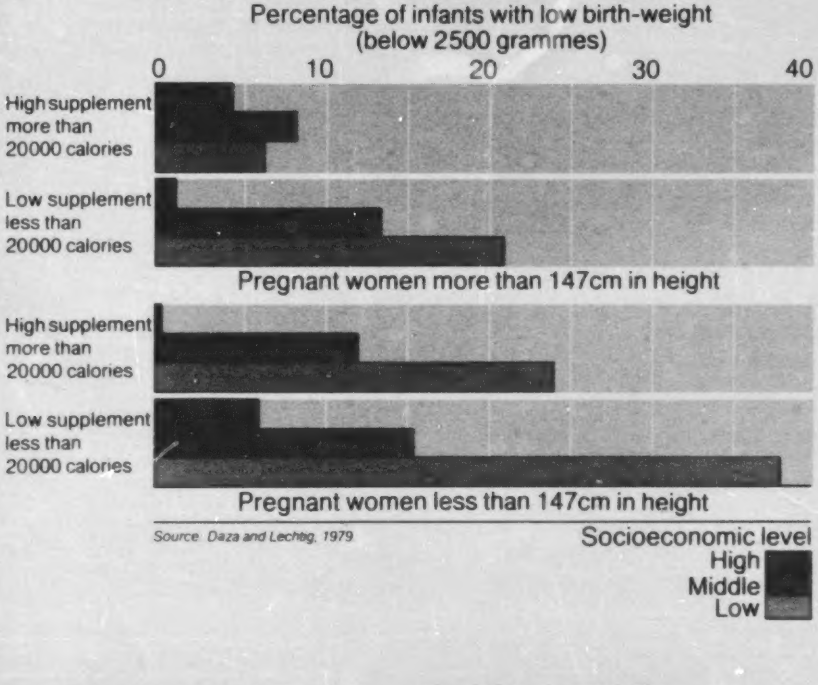
In the meantime, the malnutrition of so many children in the most formative years of their lives is itself one of the forces which undermines progress towards that ideal. For in its effect on the growth of individuals, and eventually on the capacity of communities, hunger perpetuates that cycle of low energy, low productivity, low income, and low levels of investment in community development, which result in poor health and nutrition being perpetuated from generation to generation.

Somewhere, somehow, that cycle must also be broken. And whilst the pressure must be kept up for fundamental political and economic change, direct intervention to get more food to the families most in need is also a fundamental requirement.

To make such food supplements affordable and cost-effective, they will again have to be targeted to those mothers and children who are most in need. And again it is the spread of primary health care, the use of growth charts, and community involvement in health, which can make that targeting possible.

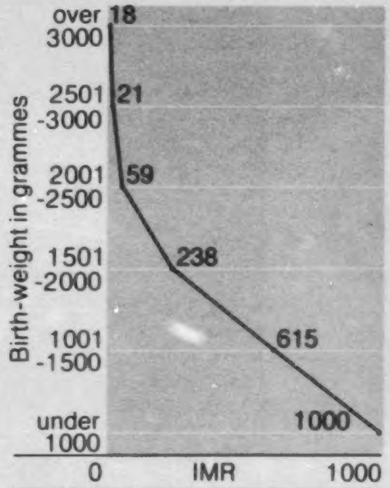
It is important for the community and the family to know, for example, that the growing body of a young child needs twice as much protein

Fig. 1.15 Effects of extra food in pregnancy on birth-weights, villages in Guatemala, 1979



Source Daza and Lechtig, 1979

Fig. 1.16 Infant mortality and low birth-weight



Note: Figures for New Delhi, India, 1969-1974

Source Ghosh, et al., 1978

Guatemala: fortifying sugar

20

At least 100,000 children lose their eyesight each year as a result of Vitamin A deficiency. The remedies – nutrition education, fortifying food with Vitamin A, or distributing Vitamin A capsules – are not always easy to organise. But they cost only a matter of a few cents and can often be dovetailed into other health care services. So in those parts of the world where children are being blinded by the lack of Vitamin A, these methods could also be powerful weapons in a child health revolution.

Vitamin A is found in milk, butter, egg yolk and liver – high-protein, high-priced foods well beyond the means of those most at risk. Cheaper sources are green-leafed vegetables, fruits and yellow vegetables such as carrots.

Usually, a store of Vitamin A is held in the liver. But long-term deficiency has irreversible consequences. Initially it affects the lungs, stomach, urinary tract and tongue. The final stage, known as keratomalacia, strikes suddenly, leading in a matter of hours to incurable total blindness and sometimes to death.

As with most deficiency diseases, young children are most at risk. They are protected while still in the womb, and breastfed babies receive an extra supply in their mother's milk; the most vulnerable age is between six months and five years.

The true figure for the numbers of children blinded by the deficiency may well be far higher than 100,000 (the deficiency is usually not detected until too late, and since it affects mainly the poor, many cases never receive medical attention and so go unreported). It is commonest in the rice-eating areas of south-east Asia and India, but is also widespread in the Middle East, in parts of the Caribbean, in north-east Brazil and in Central America.

The Institute of Nutrition of Central America and Panama has long experience of the problem. Some 30 years ago their studies in Guatemala showed that 80% of the population was deficient in Vitamin A, with more than 30% at serious risk. The Institute tried to combat the deficiency by nutrition education, but with little success: the people most at risk could not even afford enough vegetables, let alone the meat or dairy products which would have helped them most.

Massive oral doses of the vitamin every six months were another option, but one that posed intractable problems. The solution came in 1968, when it became possible to fortify foods with Vitamin A. The Institute selected sugar as the 'carrier' for Guatemala because it was cheap and most people ate it regularly. Resistance had to be overcome, but by 1975 all the nation's sugar was fortified with Vitamin A.

Two years later, the Institute surveyed 30 families in each of 12 rural communities. Four out of five families were getting more than half of the Vitamin A they needed; and 10 of the 12 villages no longer had any children at risk.

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and three times as many calories, per kilo of body weight, as an adult. It is also important to know that, because a young child's stomach is smaller, feeding needs to be more frequent.

In practice, applying such knowledge is not nearly as easy as it sounds for the poorest families. With 70% to 80% of family income being spent on food, poor mothers have to 'go for bulk' rather than nutritional balance when they shop for food. From an adult's point of view, that is usually the right thing to do in the circumstances. But a child simply cannot eat the cheaper low-protein foods like cassava in sufficient quantity to derive enough protein for growth. To get the same amount of protein as is contained in a handful of green beans, for example, a child would have to eat the impossible amount of 2.5 kilos of cassava.

Many attempts have been made by governments, international organisations, and commercial enterprises, to manufacture and market 'formulas' which provide the balanced weaning food which a child needs at a cost which the mother can afford. *Faffa* in Ethiopia, *Supramine* in Algeria, *Nutri-Nugget* in India, *Incaparina* in Guatemala – altogether some 86,000 tons a year of such formulated foods are manufactured for infants in 78 different countries. But in almost all cases they have proved to be too expensive to be within the reach of the very poor.

The more promising way forward to meet that need is again the spread of primary health care workers and women's organisations who can work with groups of mothers to prepare affordable weaning foods within the community itself. Skinned vegetables and soft fruits, mashed or ground and mixed with local cereals, can avoid the costs of packaging, marketing, transport and storage and are available to the poor at less than one-fifth of the cost of even subsidised weaning formulas.

This approach has multiple advantages – it can be integrated, for example, with hygiene education – and at no other time is the cleanliness with which food is prepared and stored as important as it is during weaning.

At the same time, the use of growth charts can be introduced and used both as a method of nutrition education, as a means of monitoring the nutritional status of a community's children, and as a device for identifying children who are at special risk and in need of food supplements.

Family spacing

Food subsidies – of some kind – are therefore going to be essential if the growth of children of the very poorest families is to be protected and if deaths and disabilities are to be even more substantially reduced.

Unfortunately, knowledge of the dangers of low birth-weight – and the means of preventing it – is slow to spread. Out of several hundred supplementary feeding programmes recently surveyed by the Harvard Institute for International Development, for example, only 15% saw fit to include undernourished pregnant women among the eligible.

By contrast, the second of the changes in the lives of women which could have a dramatic impact on child health and growth is already gaining ground rapidly in the developing world.

Ten years ago, Dr. David Morley wrote that '*medical workers, when caring for a mother and her young child, will come to realise that delaying the next conception and extending the interval between births are quite as important a part of health care as seeing that the latest child is adequately immunised*'. Since then, the rapid spread of family planning has provided evidence from almost every country that birth-spacing can indeed have a revolutionary impact on maternal and child health. Studies in India, Turkey, the Philippines and Lebanon, for example, have shown that infant mortality rates for babies born within one year of a previous birth are between two and four times as high as for babies born after an interval of two years or more. A similar survey of 6,000 women in India has shown infant mortality rates of approximately 80 per 1,000 where the interval between births was three to four years – rising to 200 per 1,000 when the interval between births was less than one year (see Figure 1.17).

Empowering mothers with the knowledge and the means to increase the interval between births

21

Oman: defeating blindness

With imaginative 'social breakthroughs', low-cost attacks can be levelled at many child health problems which blight particular regions of the world. The eye infection called trachoma, for example, has brought permanent blindness to at least five million people in the developing world – and the majority of its victims are young children. Effective treatment in the form of preventive tetracycline ointment is now available. But health services do not reach most of the children who contract the inflammatory infections which can lead to blinding lesions on the eyes. So linking the known treatment with the known need demands imaginative new approaches.

In the Sultanate of Oman, where trachoma affects 80% or more of the child population in many areas and is the country's leading cause of blindness, the Ministry of Health launched an unusual trachoma control programme at the beginning of 1980. As the most vulnerable group is the schoolchildren, it was in the schools that the battle against the disease was fought.

It was decided at the outset that preventive ointment for all children – whether they had the infection or not – was going to be more cost-effective than trying to screen out trachoma's victims. The major problem of too few health workers was boldly overcome. The health workers were to be the schoolchildren themselves.

In 372 schools, one student per class was chosen and given three days training in how to use the tetracycline ointment. At the end of each school day, the student health workers anoint all the children's eyes to cure or ward off the trachoma infection. With teachers supervising the operation and storing the jars of ointment, treatment is daily for two weeks a month over a three-month period.

In 1981, over 42,500 children in classes 1 and 2 had been treated. Follow-up surveys in 1982 showed that the effect had been dramatic. In the different regions of Oman, the incidence of trachoma in schoolchildren – who are also the main reservoir of the infection for the whole community – had fallen from 49% to 6% in Capital, 59% to 6% in Batinah, 91% to 10% in Nizwa, 80% to 11% in Ibra and from 76% to 9% in Rostaq.

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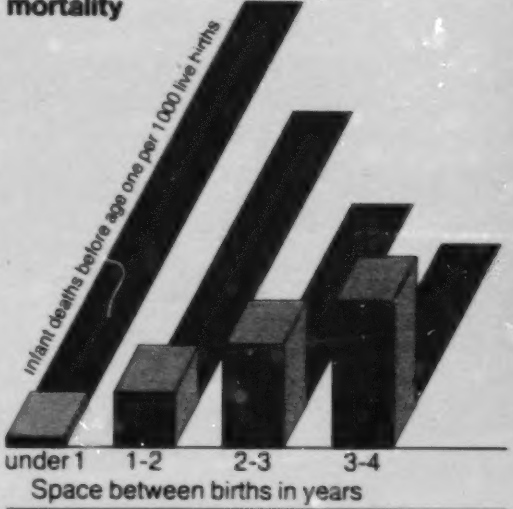
is therefore a crucial contribution which family planning can make to health. But studies in both industrialised and developing countries have also shown that 'too many' can be almost as dangerous as 'too close'. Research in China, El Salvador, Chile and Britain, for example, has shown that the chances of survival for the first and second child are slightly higher than for the third child – and very significantly higher than for the fourth and fifth child in a family. Infant mortality rates in El Salvador were found to be around 60 per 1,000 for first-born children rising to 160 per 1,000 among fifth and subsequent children (see Figure 1.19).

Finally, births to women who are younger than 20 or older than 35 are also known to increase the risks to both mother and child. Studies in Algeria, Mexico and the United States have all concluded that a child born to a woman under the age of 20 is approximately twice as likely to die in infancy as a child born to a woman in her mid-twenties.* After the age of 30, the level of risk again begins to rise (see Figure 1.18).

These risks to life and health summarised by 'too close, too many, too old or too young' hold true for all income groups, though in each case the increase in risk is exacerbated by poverty. Even in the United States, it has been estimated that infant mortality rates could be reduced by almost a third if no women were to have more than three well-spaced births.

As relevant as any of these findings is a study which shows that most women do not need scientific surveys to tell them that too many births too close together is dangerous for their own and their children's health. Out of 21,000 women interviewed by WHO in several developing countries, nine out of ten knew that the health of both mother and child was better if there were fewer births and longer intervals in between. The recent World Fertility Survey has also reported that the proportion of women with three living children who want no more is over 70% in Sri Lanka, over 65% in Bangladesh, over 60% in Thailand and Peru, and over 50% in Costa Rica, Mexico, and the Dominican Republic (see Figure 1.20).

Fig. 1.17 Birth spacing and infant mortality



Note: Space between births is the interval between the termination of the preceding pregnancy and the birth of the infant.

Source: *Omran, A.R. & Standley, C.C., ed. Family Formation Patterns and Health. Geneva, World Health Organization, 1976, p.215 (data from South India Sample, 1971-1975, 6541 women)*

In practice, many women do not have either the means or the freedom to exercise that preference. World-wide, at least half of the women who are now at risk of an *unwanted* pregnancy are not using any effective method of family planning.

Increasing women's own control over their own fertility is therefore a change which could clearly have a revolutionary impact on the health of mothers and the growth and survival of their children. And although there is a long way to go before that change is complete, recent progress has been, by any historical standards, remarkable. Only thirty years ago, there was not a nation in the world which was committed – even on paper – to the provision of family planning services. Today, 118 nations have adopted national family planning strategies and the speed with which the knowledge and the means to space child births has spread throughout the world is a tribute to the work of thousands of governmental and non-governmental organisations of all kinds who have helped to bring this change about. It is also one of

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*Probably the major reason for this is that women who become mothers at a very early age tend to be both poorer and less educated.

Indonesia and PNG: cretinism wiped out

22

The elements of the child health revolution discussed in this report are all low-cost interventions which have value wherever children fall ill and die unnecessarily. But low-cost solutions are also available for some of the major child health problems which affect particular regions of the world. One such problem is the lack of iodine in the diet.

Most common in high-altitude areas, usually far from sea coasts, iodine deficiency has been identified as the prime cause of goitre and of cretinism, which damages both mental ability and physical co-ordination.

Goitre and cretinism persist in Europe (Italy and Greece), in Africa (particularly Zaire), in South America (Peru and Bolivia) and in south-east Asia (India, Nepal, Burma and Thailand). Worldwide, several hundred million people are affected in some degree by iodine deficiency.

Iodine supplies the remedy – effectively and at very little cost. The needs vary in different areas, but 100 micrograms a day is generally considered adequate to prevent both goitre and cretinism. The technology for iodising salt, the simplest and most widely used method, has been known for almost 75 years. Iodine has also been added to bread, water, milk and even sweets (in Mexico). Another way of improving iodine levels is iodised oil, which can be injected (every three to five years) or given orally (every one to two years).

A study in Papua New Guinea has shown the dramatic impact an intervention programme can have. Initially, some 100,000 people received iodised oil injections along with their regular vaccinations. Those who already suffered from goitre found that it improved substantially, and news of this quickly spread even to remote mountain villages. Popular support was thus mustered for a mass injection programme, followed by legislation for the iodising of salt in 1972. Ten years later a survey found that all children under nine – those born after the legislation – were completely free of cretinism and goitre.

In parts of Indonesia, over a million injections of iodised oil were given between 1974 and 1978, and 20,000 tons of iodised salt were produced each year to back up the injections. An evaluation in 1981 showed a 7% incidence of cretinism in children aged 7 to 16, but none at all in children under 7.

It is cheaper to give iodised oil by mouth than by injection, but even with injections, the cost has been estimated at only 7 cents per person per year. Given the funding, and the political will to tackle the problem, there is no reason why iodine deficiency should not be completely eradicated in less than ten years.

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the best possible omens for a child health revolution. Not only is the idea of family-spacing itself spreading, but many of the networks and organisations which have helped it to spread are now turning their attention to other aspects of maternal and child health. An example of how the rapid spread of different kinds of development worker can open up new horizons are the 7,000 family planning workers who brought the means and the knowledge of family planning to a majority of Indonesia's 150 million people in only seven years and who are now working on nutrition programmes and promoting the use of growth charts in Indonesian villages (see panel No. 10).

Female education

For almost all children, the most important primary health care worker is the mother. For it is usually the mother's level of education and access to information which will decide whether or not she will go for a tetanus shot; whether a trained person will be present at the birth; whether she knows about the advantages of breastfeeding; whether her child will be weaned at the right time; whether the best available foods will be cooked in the best possible way; whether water will be boiled and hands washed; whether bouts of diarrhoea will be treated by administering food and fluids; whether a child will be weighed and vaccinated; and whether there will be an adequate interval between births.

It is therefore perhaps not so surprising that the children of more educated mothers have, in general, more chance of both survival and healthy growth (see Figure 1.21).

What is more surprising is the sheer power of

Fig. 1.18 Age of mother and infant mortality

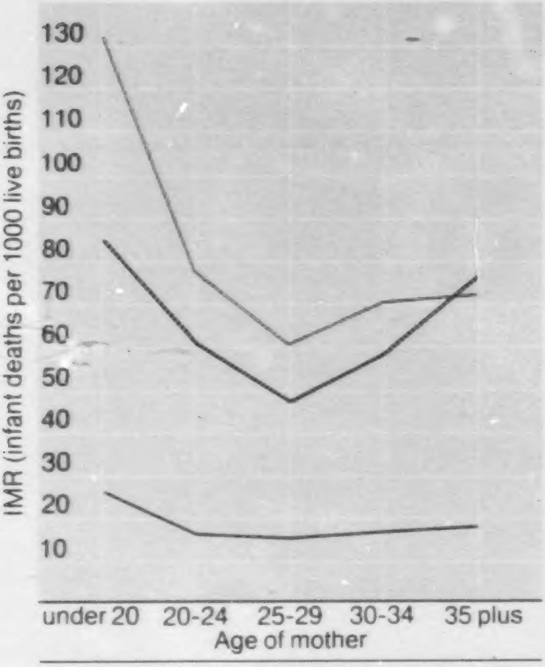
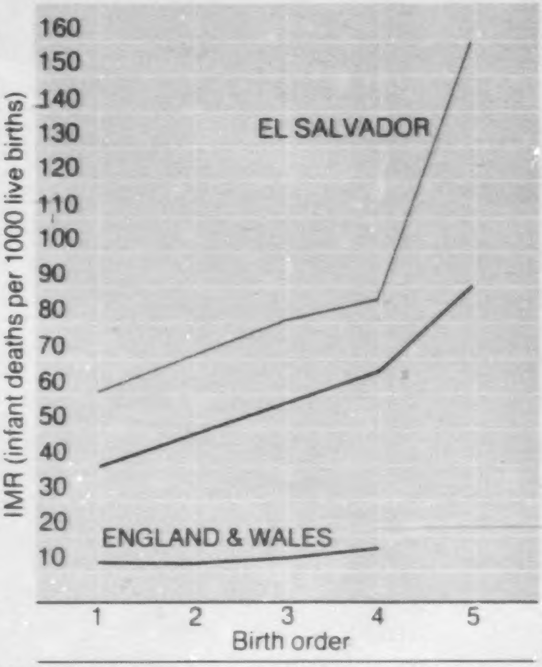


Fig. 1.19 Family size and infant mortality



Source: Maine D. Family Planning: Its Impact on the Health of Women and Children. The Center for Population and Family Health, Columbia University, New York, 1981

Pakistan: accelerating health

23

Determined to cut back its high infant mortality (over 100 per 1,000) as speedily as possible, the government of Pakistan launched a three-year accelerated health programme in July 1982. Since the main causes of infant deaths in Pakistan are communicable diseases, low birth weight and birth injuries, and dehydration from diarrhoea, the programme is dedicated to three activities – immunization, the training of traditional birth attendants (who deliver nearly 80% of babies in rural areas), and oral rehydration therapy. None of these measures is new to Pakistan; but over the past years they have made little headway.

Pakistan now aims to immunize all its 15 million children by 1986 and the campaign has begun in every province. The new approach calls on all possible community resources, and not just on immunization staff.

In the district of Larkana in the province of Sind, for instance, a crash vaccination programme has been launched. The district immunization council, made up of the district administration, local voluntary organisations and community leaders, set an ambitious goal: immunizing all the district's children within four months in three one-week drives.

Massive publicity was organized to ensure community participation – banners with slogans, circulars to parents, public addresses, slide shows, leaflets, and door-to-door visits. Boy scouts, volunteers and social workers helped the parents bring their children to the vaccination points.

In the urban areas of Larkana, 90% of the target children were vaccinated in the first round, 74% in the second round, and 62% in the third. In the rural areas the crash programme reached 87%, 62% and 59%, respectively, in each round. During the previous two years, each of Larkana's immunization centres had vaccinated, on average, only four children a day; and more than 80% of those children had never returned for their second and third doses of polio and triple vaccine.

The accelerated health programme aims at training 50,000 traditional birth attendants, so as to provide at least one for each of Pakistan's 45,000 villages and urban slums. The training curriculum has been revised to broaden their skills, and organisations other than the health services are encouraged to take part in the selection and training processes. In Mansehra district, in the North-West Frontier Province, for example, village health committees and local representatives select the attendants for the training, which is then undertaken jointly by the provincial health department and district councils.

The third component of the accelerated programme involves the distribution of oral rehydration salts. For its first year the programme aimed to distribute 5 million packets of salts, to rehydrate two million children; the previous year's figure had been only 1 million packets.

Despite some inevitable teething troubles, the accelerated programme has so far come close to meeting its ambitious goals. Three million children were immunized, against a target for the year of five million; 5,000 traditional birth attendants were trained, against a target of 8,000; and 5 million packets of oral rehydration salts were distributed as planned. This represents a tripling of the number of vaccinations over the previous year, and a five-fold increase in the number of birth attendants trained. The enthusiasm for immunization has been particularly marked. In the whole of 1982, 133 new vaccination centres were set up; during the first three months of 1983, 181 new centres have opened their doors.

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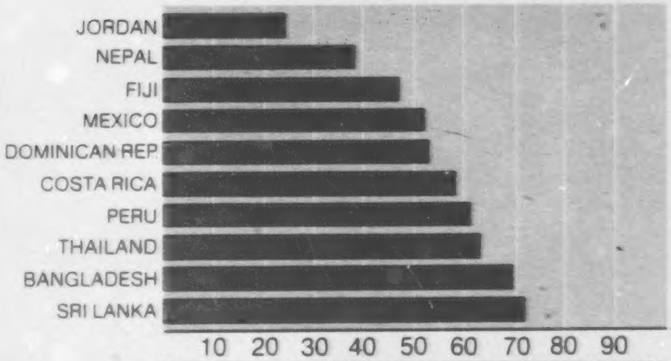
the leverage which the educational level of the mother exerts on the well-being of the child – and the fact that this leverage retains so much of its power even in very poor environments.

In total, over 24 separate studies in 15 different nations have established that the level of the mother's education – even within the same economic class – is a key determinant of her children's health. In Pakistan and Indonesia, for example, the infant mortality rate among children whose mothers have had four years of schooling was found to be 50% lower than among the children of women who were illiterate. In eleven countries studied by the Latin American Demographic Centre (CELADE), the influence of the mother's education on the child's chances of survival was found to be stronger even than the level of household income. One particular study in Kenya has even gone so far as to say that 86% of the decline in infant mortality in that country over the last twenty years can be 'explained' by the rise in female education.

Empowering women by education is therefore the third of the improvements in the lives of women which could also have a revolutionary impact on the well-being of children. Whether she enters the work-force or not, investing in a minimum of four years at school for every girl is one of the most cost-effective investments which any country can make in its own future.

Fig. 1.20 Percentage of women with three living children who want no more pregnancies



Source: *Maine D. Family Planning, Its Impact on the Health of Women and Children. The Centre for Population and Family Health, Columbia University New York, 1981*

Fig. 1.21 Maternal education and infant mortality

Deaths of children under 2 (per 1000) by education of mother in Latin America

COUNTRY	None	1-3	4-6	7-9	10 plus
PARAGUAY 1972	104	80	61	45	27
COSTA RICA 1973	125	98	70	51	33
COLOMBIA 1973	126	95	63	42	32
CHILE 1970	131	108	92	66	46
DOMINICAN REP. 1975	172	130	106	81	54
ECUADOR 1974	176	134	101	61	46
EL SALVADOR 1971	158	142	111	58	30
BOLIVIA 1975	245	209	176	110	
	YEARS OF SCHOOLING				

Source: *S.H. Preston, Mortality Morbidity and Development. Paper presented at the seminar on Population and Development in the ECWA Region. 20 September 1978.*

In some parts of the world, there is still a resistance to the idea of female education among those who fear that it might also lead to the emancipation of women themselves. And worldwide there is still a significant difference between the enrolment – and the school drop-out rates – of boys and girls. Among 6–11-year-old children in the low-income countries, for example, about 90% of all boys and a little more than 60% of all girls are enrolled in school. Usually, the reasons for this discrepancy are to be found more in the society than in the school itself. Even 'free' education is expensive when parents are too poor to easily afford books, clothes, shoes and transport. For girls – who are often wanted to help with household tasks and child care and for whom education is often not considered to be so necessary – this expense may prove too much. So an investment which could improve life tomorrow is withdrawn to help cope with life today.

Despite this persistent discrepancy, education for girls is a change which is well underway. The proportion of 6–11-year-old girls who are enrolled in school in the poorest half of the world, for example, has jumped from 34% to 80% since 1960 (see Figure 1.1). By any standard, that is remarkable progress. And because of what it can achieve for both women and children, the rise of female education deserves to be regarded as one of the great achievements of the last twenty years and one of the most hopeful signs for the next twenty. For that significant change in the education of girls during the 1960s and 1970s is now beginning to show through as a significant change in the proportion of mothers who are literate in the 1980s. And the fact that a much higher proportion of today's mothers are educated is another of those 'social breakthroughs' which can now help to put 'technological breakthroughs' into the hands of those who need them. Any attempt to promote the advantages of breastfeeding or to warn of the dangers of bottle-feeding, or to spread the knowledge of oral rehydration therapy, or to organise immunization campaigns at set times and places, or to introduce the use of growth monitoring charts or family spacing methods, now stands considerably more chance of success. For any mother who is literate has both more opportunity to learn about new ideas and more confidence to put them into practice.

Slowing population growth

These three improvements in the *lives of women:*

○ More food for at-risk women and children during the crucial times of pregnancy, breastfeeding and weaning

○ More choice for women over both the size of their families and the interval between births

○ More education to increase women's access to vital information

– have also been shown to be amongst the most powerful of all influences on the state of the world's children. And it is not a coincidence that all of these policies were vigorously adopted by the People's Republic of China, the Republic of Sri Lanka, the Republic of Korea, Kerala and Taiwan, whose successes in achieving breakthroughs in health at low levels of economic development were described earlier in this report.

In these five successful cases, subsidised food for the poorest has significantly reduced malnutrition, health and family spacing services have been put at the disposal of every couple, and almost 100% of girls are enrolled in school. The fact that the rate of infant deaths in these areas is approximately 50% less today than the average for the developing world as a whole is testimony to the power of these changes.

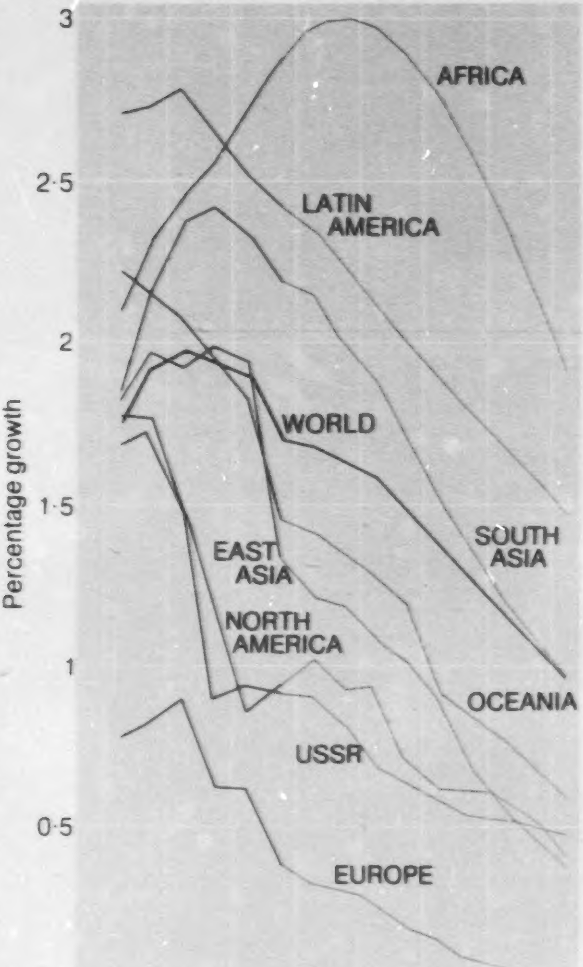
But on looking again at these examples, there is one other common characteristic which is important to the idea of a child health revolution. In all of these cases, population growth has slowed down and births-rates have fallen to among the lowest in the developing world.

At first sight, it would seem paradoxical that the rate of population growth should fall when the rate of child survival has been drastically improved. But the explanation of that paradox should allay the fears of those who believe that a child health revolution would lead to another population explosion. For in practice, reducing rates of infant mortality is likely to help stabilise world population growth at a lower level and at an earlier time.

Child survival tends to reduce birth rates in three separate ways. First, child survival usually means that the mother continues breastfeeding. As is now well established, breastfeeding is a natural contraceptive, releasing prolactin in the mother's body and delaying the return of ovulation. In the case of Kerala, for example, the death of a child during the first month of life reduces the average interval between births from three years to less than two years. A child dying even in the second year of life reduces the average birth interval by almost six months. Similarly, studies in the Gambia have shown that if a baby dies in the first month of life then the average time before the next birth is only 16 months; if a Gambian child survives for the first two years, on the other hand, then the average gap between one birth and the next increases to about three years. In Bangladesh, the average interval between one birth and the next is also increased by more than a year if the first child survives its infancy.

Secondly, improved child survival means that the parents can more confidently give birth to only the number of children they actually want – rather than having extra children to compensate for the fact that one or two or more of their children might die. This link between surviving children and family planning was one of the patterns which came under particular scrutiny during the Narangwal study. Its conclusion was that the fewer the children who died, the greater the likelihood that the mother would use an effective method of family planning – even among women with the same number of surviving children.

Fig. 1.22 Annual rates of population growth, by region, 1950–2025



Source: Demographic Indicators of Countries: Estimates and Projections as assessed in 1980. United Nations, New York, 1982

That is why this year's *State of World Population* report from the UN Fund for Population Activities concludes that '*birth-rates can be expected to remain high in countries where infant mortality rates are high*'. Meeting under the auspices of the US National Academy of Sciences, a committee of distinguished demographers has come to the similar conclusion that '*policies and programmes aimed at reducing infant and child mortality considerably below present levels may be an essential under-pinning of government programmes for fertility control ... as death rates are brought below 10–15 per thousand in present high-fertility, high-mortality countries, birth rates should be correspondingly reduced*'.

A third mechanism by which an increase in survival can lead to a decrease in births is both more profound and perhaps more powerful. Whether or not a husband and wife will decide to plan the number and spacing of their children is closely related to their own sense of control over their own lives and circumstances. Malnutrition, illiteracy, ill-health and oppression, can leave people with so little sense of control over their own lives and circumstances that they are alienated from the very idea of 'planning'. To expect adults who cannot control or plan any other major aspect of their lives to suddenly start planning just their families is to misunderstand what powerlessness means. If, on the other hand, progress in health and education, in political participation and economic activity, has helped to create a greater sense of mastery over one's own destiny – a sense that decisions can be taken, circumstances changed, and lives improved – then the idea of family spacing is likely to be welcomed as another opportunity to take more control over one's own life.

From this point of view, better health and growing confidence in child survival, especially if brought about in part by one's own decisions and actions, becomes a part of that change in mentality.

All of the strategies discussed in this report promote that sense of participation – that sense of

Thailand: training 6000

24

In 1975, scarcely a quarter of Thailand's population were within easy reach of government health services. To accelerate health improvement for the majority, and especially children, health spending was tipped in favour of primary health care; a national policy for primary health care was adopted in 1977.

The national programme builds on the experience gained in a number of experimental projects dating as far back as 1969. One of the most extensive of these was launched in 1975 in the northern province of Lampang, a region of rice farmers with a population of 660,000 in over 500 villages.

To support action for health, four new kinds of health worker were recruited and trained in Lampang province between 1975 and 1979:-

○ Full-time paramedics, known as *wechakom*, were recruited from the ranks of existing health workers, mainly nurses, and given a one-year intensive training course in the most common health problems of the region. Most of the *wechakom* were then assigned to rural health centres serving about 5,000 people.

○ In each village, a village health post volunteer (two in larger villages) was given two weeks training in health and nutrition education, family planning services, simple drug dispensation, and first aid. The volunteers were also taught when and how to refer more serious cases to more qualified people. Sales of basic drugs in the community were priced to allow the volunteers a small profit. All the volunteers were also entitled to free medical care.

○ Village health communicators, with only two days training, assisted the health post volunteer and took particular responsibility for groups of 10 to 20 families.

○ Traditional birth attendants serving the villages were given two weeks training in pre-and post-natal care.

By 1979, the primary health care staff trained and in action numbered 92 *wechakom*, 918 village health post volunteers, 5,359 health communicators, and 352 traditional birth attendants. Over 28% of all requests for medical care and family planning were being handled by health post volunteers, and applications to hospitals were reduced.

Over the same period, the back-up system for the primary health care workers was also strengthened by the spread of rural health services. The number of child nutrition centres in Lampang, for example, rose from 11 to 100 and the number of district hospitals from two to seven during the course of the project.

Although there is a long way to go before 'health for all' becomes a reality in Thailand, health support is now within reach of two thirds of the Lampang population. Over the four years of the Lampang experiment, the proportion of young children making use of health services rose by 25%; the proportion of births attended by trained midwives doubled to almost 80%; and the proportion of women using health services increased from 30% to 45%.

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being able to affect and improve one's own and one's children's lives. Therefore quite apart from the direct effect which campaigns to promote breastfeeding, birth-spacing, and female education might have on birth-rates, the bringing about of a child survival revolution by the strategies discussed in this report would in itself be likely to lower birth-rates.*

All of these mechanisms linking falling death rates to falling birth rates take time to work themselves through. In the recent past, it was this time-lag between falling mortality and falling fertility which resulted in the 'population explosion'. So even though a child survival revolution would lead – eventually – to falling birth rates, wouldn't population growth again increase sharply during the 1990s? The answer is almost certainly 'no – not this time'.

The reason is that the length of time it takes for birth rates to fall in response to a fall in death rates seems to depend on the degree of progress in reducing death rates which a nation has already made. In the post-war period, a definite pattern seems to have emerged. If a nation's death rate is very high – say, 25 per 1,000 – then reductions in that death rate tend to take quite a long time to produce the corresponding reduction in the birth rate. If, on the other hand, a nation's death rate has already been reduced to as low a figure as 15 per 1,000 – then beyond that point further reductions in the death rate have usually been associated with a much more rapid and steep fall in birth rates. Almost all the countries which had lowered their overall death rates to 15 per 1,000 by the early 1960s, for example, have subsequently seen their birth rates fall by a multiple of every further and subsequent one-point fall in the death rate.

In Thailand, for example, a fall in the death rate from 15 to 8 per 1,000 between 1960–1981 was accompanied by a 14-point fall in the birth rate. Similarly in the Philippines, a fall in death rates from 15 to 7 over that same period was accompanied by a 13-point fall in the birth rate. Colombia, Turkey, Malaysia, the two Koreas, Lebanon, Mexico, Costa Rica, the Dominican Republic – all had death rates of between 10 and 16 per 1,000 in 1960. All of them have since reduced those death rates by a further 5 to 9 points, and in all the birth rate has declined by between 9 and 19 points. And if, as in all of these cases, the birth rate is declining faster than the death rate then, by definition, population growth is slowing down.

The importance of this trend is that the overall death rate in the lower-income developing countries (excluding China where death rates have already been reduced to less than 10) is now approaching that critical death-rate figure of 15 per 1,000. In other words, many nations are now at the point beyond which each further advance in lowering the death rate should, on the evidence of demographic history, lead to a much greater fall in the birth rate.

In sum, a revolution in child survival is likely to result in a slowing down of the rate of population growth and to contribute to the stabilisation of world population at an earlier date and at a lower total. As some measure of how significant that contribution could be, India would today have approximately 4.4 million fewer deaths each year and 7.5 million fewer births each year – resulting in a much lower rate of population growth – if the entire nation had the same low death rates and low birth rates as the state of Kerala.

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*If increased child survival did not have any effect in lowering birth rates, then it would obviously lead to an increase in population. But as fertility rates are already declining quite steeply in most parts of the developing world, the new 'survivors' would not add as much to future population growth as would have been the case in the past (see Figure 1.22). Even if the infant mortality rate in the developing world were to fall overnight to European or American levels, for example, and even if this did not lead to any reduction in the birth-rate, the overall impact would be that world population would be stabilised at approximately 9.3 billion as opposed to 8.5 billion some time towards the end of the next century. *Because declining infant mortality is known to influence people towards smaller families, a halving of infant death rates would almost certainly result in a further slow-down in the rate of population growth and a lower final total.*

Nepal: corner shop care

25

In most developing countries the official health services now reach only about a quarter of the population. If new low-cost ideas and technologies are to be put into the hands of those who need them most, then not just the health services but every possible other channel will have to be used. Often, that will mean opting for the unconventional approach.

In Nepal, only one person in five lives within easy reach of health services and the government health centres themselves often run through their year's supply of drugs within the first three or four months. So people with health problems have to seek help wherever they can. Usually, that means consulting one of the country's two thousand local drug-sellers.

Many of the drug-sellers are village shopkeepers with a few popular drugs on their shelves. But they are often respected members of the community with more education than most. And through their hands pass 90% of all the drugs and antibiotics which enter Nepal each year. Until now they have needed neither training nor qualifications nor licences to import and sell such drugs, and most of their information about them comes from travelling drug-company representatives. About one third of their wares are 'tonics' conferring no known benefit. Other items on their shelves include dangerous drugs which have been banned in other nations.

It was the drug retailers themselves, acting through their own professional association, who approached the Institute of Medicine in Kathmandu asking for help in raising their own professional standards. Seeing the opportunity, UNICEF's Kathmandu office agreed to pay for training courses for the drug retailers. In co-operation with the government of Nepal, purpose-designed 40-hour training courses have been set up at times and places designed to fit in with a shopkeeper's business hours. So far, 500 drug retailers have been through the course. On the way, they have learnt to advise people about the correct use of medicines and to recommend appropriate drugs for the treatment of some common health problems. Those who pass the final exam leave the course equipped with a professional certificate and a detailed handbook to guide them in their work.

The training has brought about notable changes in the drug retailers' ways of doing business. In Kathmandu, for example, they have voluntarily ceased over-the-counter sales of a once popular but highly addictive sedative. Customers with a persistent cough are no longer sold antiobiotics or just another bottle of cough medicine: most trained retailers now advise them to go to the nearest clinic for a tuberculosis check-up.

Most important of all, in a country where diarrhoeal disease causes so many infant deaths, many retailers are now not only stocking and selling packets of cheap UNICEF-subsidised oral rehydration salts but carefully briefing mothers on how to mix and administer the contents of the packets and stressing the importance of rehydration therapy.

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Inner Development

The combination of breakthroughs in knowledge, techniques and social organisation which are coming together at this time could and should make it possible to bring about a revolution which can save the lives of 20,000 children every day, prevent an equal number of disabilities, and promote the healthy growth and development of many millions more. Furthermore, the confidence and sense of greater control over their own lives which families and communities can gain through simple, affordable, and visibly effective strategies, can both help to slow down population growth and help to build community acceptance of, and enthusiasm for, the wider ideal and infrastructure of primary health care itself.

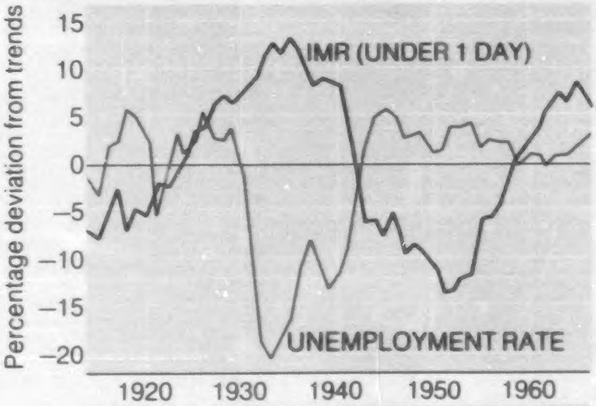
The knowledge and techniques by which this can be achieved ought now to be communicated world-wide in order to put them at the disposal of every nation, every community, and every family. For the surest guarantee of permanent and self-sustaining improvement in the life of any community is the organised and active participation of that community itself.

It can, of course, be said that the strategies which can bring about these drastic improvements in child well-being do not tackle the fundamental causes of poverty and ill-health. In considerable measure, this is true.

It is true, for example, that in the developing world as a whole the poorest 40% of the people share only about 10% to 12% of their nation's income and that income is also one of the most important determinants of child health and well-being (see Figures 1.23, 1.24, 1.25). In New Delhi, for example, the infant mortality rate in the mid-1970s was found to be 180 per 1,000 among the children of those who earn less than 20 rupees per month as opposed to only 12 per 1,000 (lower than the average for the United States) among the children of families earning more than 300 rupees a month. Similarly, the infant mortality rate among the rich of a city like Port-au-Prince, Haiti, is the same as in the United States – whereas one child in every five dies in the slums of that same city.

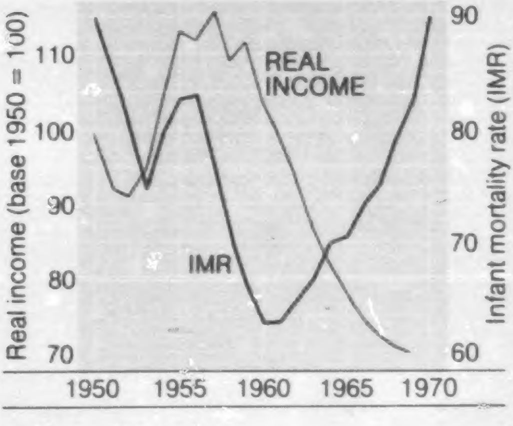
It is also true that in many nations the poorest 40% of people in the rural areas may own only 1% or 2% of rural land and that landholding – which of course affects food and income – is also an important influence on a child's chances of health and survival. In Guatemala or Bangladesh, for example, infant mortality rates have been found to rise steeply as the size of family landholding falls (see Figure 1.26). And in many parts of the

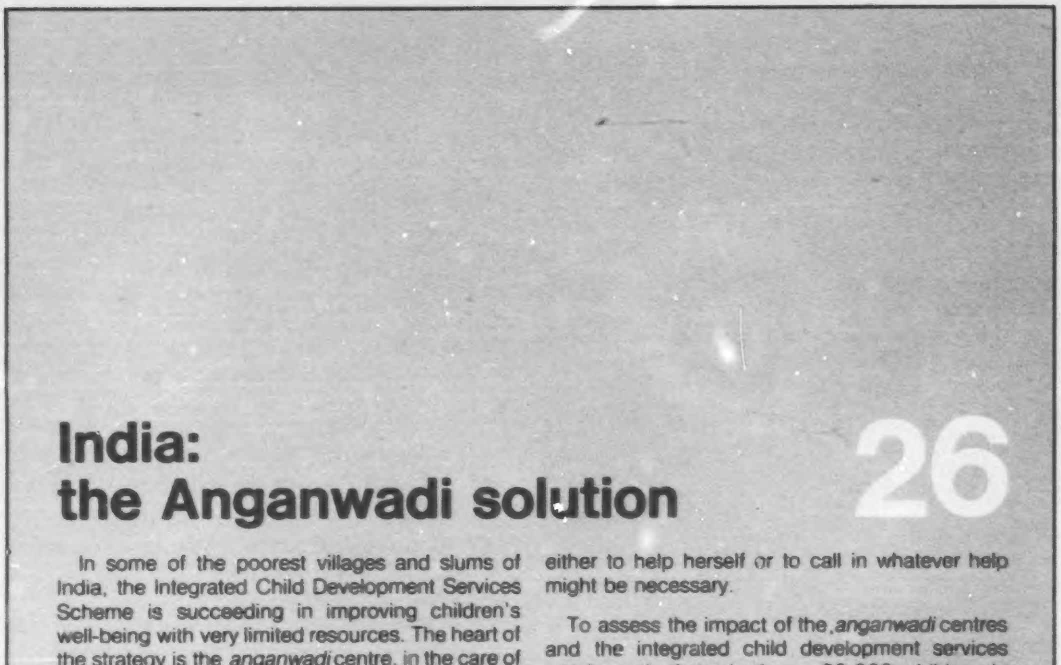
Fig. 1.23 Economic trends and IMR (first 24 hours), United States, 1915–1965 IMR = Infant deaths per 1000 live births



Source H. Brenner, Fetal, Infant & Maternal Mortality During Periods of Economic Instability Int. J. Health Services 3:145-159, 1973.

Fig. 1.24 Income and infant mortality, Sao Paolo, 1950–1970





India: the Anganwadi solution

26

In some of the poorest villages and slums of India, the Integrated Child Development Services Scheme is succeeding in improving children's well-being with very limited resources. The heart of the strategy is the *anganwadi* centre, in the care of a specially trained woman chosen for her knowledge of the area and its people. So far, *anganwadi* centres have been set up in 300 rural and urban projects with a total population of about 30 million people. By 1985, the government of India proposes to establish 1,000 such projects.

The *anganwadi* worker herself receives a small monthly payment and spends about three quarters of her time in teaching families better hygiene and nutrition, organising supplementary feeding for children seriously at risk, providing non-formal pre-school education for children, and conducting functional literacy classes for women. Just as important, she is the focal point for integrating all other child services available to that community. It is through the *anganwadi* centre, for example, that the immunization teams work and that the visiting paramedics provide health check-ups, pre- and post-natal care, and treatment of common local illnesses. From the community's point of view also, the *anganwadi* centre is a focal point – the place where families can bring their children in the knowledge that the *anganwadi* worker will be able either to help herself or to call in whatever help might be necessary.

To assess the impact of the *anganwadi* centres and the integrated child development services which work through them, 28,000 children in different 'blocks' were surveyed *before* the *anganwadi* workers took up residence and the scheme began. Three years later, researchers returned to those same blocks to carry out a similar survey. The results:-

○ The proportion of children immunized against diphtheria, pertussis and tetanus had risen from 5% to 35%. Against tuberculosis, immunization rates had doubled to 44%.

○ Sixty-one per cent of children had received health checks as opposed to only 18% before the *anganwadi* centre was opened.

○ Over half of the children were receiving vitamin A supplements to prevent blindness. Before the scheme began, only 10% of children were protected.

○ The proportion of children receiving supplementary food had doubled to 55%.

○ The proportion of children found to be severely malnourished was down from 19% to 11%.

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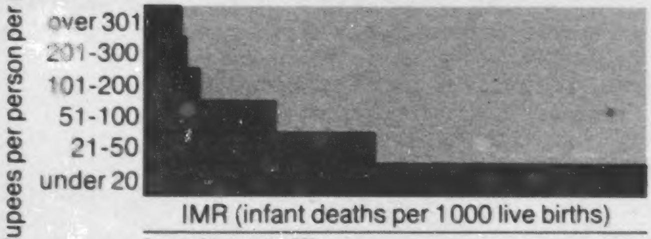
Fig. 1.25 Income and infant mortality, New Delhi, 1969–1974



Source: Ghosh, et al., 1979

world, half of the young children are malnourished whilst half of the land is used to grow cash crops for export to those who can afford them rather than food crops for consumption by those who need them.

Greater justice, both within and between nations, is therefore of fundamental relevance to the well-being of children. Within nations, even moderate measures to help the incomes of the poorest 20% grow just a little more quickly would greatly reduce the incidence of malnutrition by the end of the century. Between nations, one-quarter of the annual *increase* in the industrialised world's wealth could double the *total* annual budgets for both health and education combined in all the developing nations.

The industrialised nations, containing a quarter of the world's people, still control more than three quarters of the world's wealth. By and large, that gives them the power to lay down the rules of world trade, regulate the workings of the international monetary system, decide what investments will be made and where, determine the course of scientific and technological research, and organise the international division of labour largely in their own interests. As a result, the majority of developing countries have correspondingly little control over the price they receive for the raw materials they have to sell, or the price they pay for the manufactured goods they have to buy, or the value of the currency they must use, or the world monetary system within which they must earn their living, or the terms of the investments they seek, or the amounts and conditions of the aid they receive.

All of these are fundamental problems having a direct effect on national revenues, on governmental services, on employment opportunities, on family incomes, and therefore on children's well-being. Their solution depends on the long struggle for economic growth, economic justice and social development.

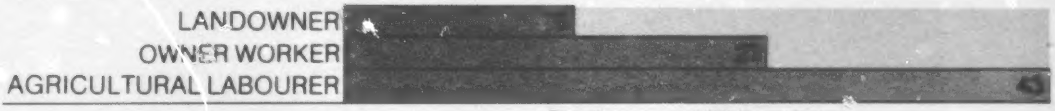
Progress in solving these problems is tragically slow. And for at least the next few years, the fact must be faced that there is little likelihood of any vast increase in the scale of resources available for development. In that context, the emergence of low-cost opportunities to re-gear the ratio between resources and results and accelerate progress for the world's neediest children cannot be ignored.

Exactly ten years ago, those children were made a promise by the international community. At the closing ceremony of the World Food Conference in 1974, the objective was proclaimed 'that within a decade no child will go to bed hungry, that no family will fear for its next day's bread, and that no human being's future and capacities will be stunted by malnutrition'.

Tonight, more children will go to bed hungry, their capacities stunted, than on the night those words were spoken.

How much longer are we going to ask them to

Fig. 1.26 Occupation of household head and child death rate, Matlab, Bangladesh, 1974–1977



wait? Definite actions with definite results, actions capable of large-scale impact at relatively low financial and political cost, are available *now*. And they are actions in which almost everybody can be involved.

Nor should it be assumed that these actions are not addressed to some of the fundamental problems of world poverty. Inasmuch as they can put into people's hands and minds the means to bring about improvements in their own lives through their own efforts and their own organisations, they can help to build a sense of self-respect and self-determination and create an ethos which contributes to further progress and greater justice.

And inasmuch as they can play a part in one of the most fundamental tasks of all – the protection of that process of 'inner development' in the growing minds and bodies of young children – they can help to break into the cycle by which poverty and injustice have so long been perpetuated. That is why the child health revolution touches the roots of the development problem. And that is why it offers new hope for today's children – and tomorrow's world.

Recession: The impact on children

During 1983, a special study The Impact of World Recession on Children *has been prepared by UNICEF staff and field offices assisted by an international panel of distinguished economists. The study, including ten country case studies,* appears in full as Chapter V of* The State of the World's Children 1984. *The following is a brief synopsis of its evidence and argument.*

The world economy is now in its deepest and most sustained recession since the Great Depression of the 1930s. Yet in all the recent writings on recession, not a single study has looked at its impact on the most vulnerable half of the world's people – the children.

The main problem facing any such study is the lack of even elementary statistical information about changes in child well-being. For most countries, rich or poor, it is easier to find out how many dishwashers have been sold than it is to find out how many children have been immunized. What is needed, in all countries, is a *child monitoring system* to provide an early warning of any deterioration in the well-being of the rising generation.

Despite this deficiency, fragmentary evidence of the recession's impact on children is beginning to surface in different parts of the world. In Zambia, information from the poorer northern regions is indicating a fall in children's height-for-age. In São Paulo, the proportion of low-birth-weight babies is rising. In Costa Rica, the number of children being treated for severe malnutrition has doubled between 1981 and 1982. In the USSR, infant death rates have risen sharply. And in the United States, infant mortality rates have also risen in areas such as Alabama and Michigan, which have been particularly hard hit by recession.

As these examples suggest, it is usually the poorest members of society who are most exposed.

In all countries, the poor spend a greater proportion of their incomes on necessities such as food or fuel or basic medical care. Any decline in that income therefore threatens not just material progress but the ability to maintain health and life. In such circumstances, the risk is greatest to the growing minds and bodies of young children.

Multipliers

This economic vulnerability is paralleled by the political vulnerability of the poor. Many of the mechanisms which link the international economic system to the poor neighbourhoods of the developing world are mechanisms which act like reverse shock absorbers – increasing the impact of recession as they pass that impact down the line. It has been estimated, for example, that a 1% fall in the rate of growth of the industralised countries tends to produce a 1.5% fall in the average rate of growth of the developing countries. Within the developing nations themselves, an echo of that same process passes the economic shock-wave on to the poorest sections of their own societies. A 2% to 3% decline in the average income of a developing nation, for example, can easily result in a 10% to 15% decline in the income of the poorest classes. Finally, this same process may happen again within the poor communities themselves: in many societies, females and young children depend on what is left – of the evening meal and of the weekly wage – after their husbands and older sons and have met their needs.

By such mechanisms is the greatest burden of the world economic recession passed on to those who are least able to sustain it. Ironically, the main protection for the very poor has been the fact that so many of them live in rural areas which are only peripherally linked to the world economy. Although many of the rural poor have escaped the full impact of the recession, drought and poor harvests have had a serious effect, particularly in the last two years.

Falling Incomes

Family income is perhaps the main medium for the transmission of recession's impact to the children of the poor. And in many parts of the world, average real family incomes have fallen, often sharply and over several years, as a result of the recession and world-wide inflation. In the Latin American region, for example, average incomes have now been in decline for two consecutive years. Income per person in Brazil fell by over 4% in 1981 and by almost another 2% in 1982. In Chile, per capita GNP fell by 15% in 1981 alone and in Costa Rica real incomes have fallen by as much as one-third. These averages often disguise even steeper declines among the poor and unemployed.

Africa, the continent with the least to fall back on, has undoubtedly been hardest hit in recent years. Real per capita income in more than half the countries of Africa is less today than ten years ago. With recession in many countries compounding the effects of drought, wars, and the long-term set-backs of inflation and oil price increases, overall per capita GNP in Africa south-of-the-Sahara fell by an estimated 2% between 1979 and 1980 and is expected to show another 2% decline for 1982.

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*The countries selected are Tanzania, Sri Lanka, India, Zambia, Nigeria, Brazil, The Republic of Korea, Chile, Costa Rica, and Cuba.

Hardest hit of all are the nations dependent on raw material exports to the industrialised world. In 1982, for example, the world price of copper fell to its lowest level for 50 years: in copper-dependent Zambia, government capital expenditure has been cut by two-thirds and average incomes have been almost halved in recent years. Least affected of all the regions of the developing world is Asia, where many nations are protected from the worst effects of recession either by their relative self-sufficiency (as with China and India) or by their past economic progress.

Although recession's impact differs from nation to nation, most of the countries for which data are available are showing an increase in the number of children living below national poverty lines and a widespread deterioration in the quality of children's lives.

Welfare cut-backs

Alongside falling family incomes, cut-backs in government services for children are the other main medium by which economic recession is transmitted to the lives of the young. Because social welfare programmes, and particularly those for children, are usually not protected by powerful interest groups, and because they are often erroneously regarded as 'uneconomic', they generally suffer quickly and disproportionately from any forced cut-backs in government expenditure in both industrialised and developing countries. Under the impact of recession the *share* of government expenditure devoted to basic needs programmes has declined in many nations.

Overall, the economic recession has contributed to a decline in both the quality and quantity of services for children – from maternal and child health clinics and immunization programmes to supplementary feeding and primary schools.

Policies

Fortunately, economic set-back and child well-being are not linked in a fixed ratio. Several nations have achieved levels of health and education for their children which are measurably higher than other nations where average incomes may be twice as high. The impact of world recession on children is ultimately more a matter of political policy than of economic inevitability. Within the developing countries, policies to protect children from recession should begin with the recognition that investments in the health and education of the young should be the last, not the first, to be cut back. Economic adjustment policies should be consciously designed to restructure in ways which protect children, the poor, and the vulnerable – not ignore them or sacrifice them in the name of economic efficiency. Whether judged by hard-headed economic calculation or by the elementary tenets of human welfare, protection of the physical and mental capacities of a nation's people and a nation's future is the most fundamental of all investments. The maintenance of basic services, minimum standards of nutrition, health, education and household income, is therefore the first and most important line of defence for a nation's children. In practice, that defence will usually require a more equitable distribution of income.

Internationally, protecting and improving the lives of children could be helped by ending recession and reviving economic activity through the lowering of interest rates, import duties, and trade restrictions by the industrialised nations. At the same time, the immediate policy of the main international financial institutions needs to be reviewed to stop the main burden of recession from falling on the poorest people and to protect high-priority social and health services. And although such appeals continue to echo emptily down the corridors of power, higher levels of development assistance, equivalent to only a very small percentage of the world's current expenditure on armaments, could and would improve the lives of the world's children.

The Response

The evidence we have of a deterioration in the lives of children should be taken as a clear warning. For, almost certainly, the worst is yet to come. The impact of recession takes time to work through the channels which lead to children. And our knowledge of that impact, in the absence of any systematic and sensitive child monitoring service, also lags behind the event.

Our response to this warning must be both humane and 'realistic'. The recession is a fact of life. And it means that there will almost certainly be no large-scale increase in the level of resources available for improving child well-being in the poorest half of the world during the 1980s.

What we are now faced with is therefore a challenge to policy. All countries should review their national and international policies to assess their impact on children, the poor, and the vulnerable – and to see how that impact can be ameliorated. The fact of recession means that progress for children now will have to depend more than anything else on improving the ratio between resources available and results achievable. It is in this overall context that the 1984 *State of the World's Children* report is presented. For the high-impact, low-cost strategies which it draws together are examples of what can be done to streamline the effort to improve the lives of children so that progress may be maintained and accelerated even against the headwind of world recession.

II

LIFELINES

Six essays on the potential contribution of the principal strategies discussed in this year's State of the World's Children Report.

1. Oral Rehydration Therapy
Dr. Jon E. Rohde, Representative, Management Sciences for Health, Port-au-Prince, Haiti

2. Growth Monitoring
Dr. David Morley, Professor of Tropical Child Health, University of London, United Kingdom.

3. Expanded Immunization
Dr. Ralph Henderson, Director of the Expanded Programme on Immunization, World Health Organization, Geneva, Switzerland.

4. Breastfeeding
Dr. Natividad Relucio-Clavano, Chief of Paediatrics, Baguio General Hospital, Baguio, The Philippines.

5. Family Spacing
Deborah Maine and Dr. Joe Wray, Center for Population and Family Health, Faculty of Medicine, Columbia University, New York, U.S.A.

6. Food Supplements
Dr. Kusum Shah, Associate Professor of Obstetrics and Gynaecology, Grant Medical College and J.J. Government Hospital, Bombay, India.

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Oral Rehydration Therapy

by Jon E. Rohde

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There are diseases whose very names strike terror: plague, for instance, or polio or smallpox. And there are others which are regarded as nuisances, like the common cold or 'having the runs' – inconvenient but not serious.

And yet the deadliest killer of small children in the world is one of these everyday illnesses. In the poorer communities of Asia, Africa and Latin America, five million children die every year of diarrhoeal infections. From this cause, a child will have died in the time it has taken to read this paragraph: one, on average, every six seconds.

The number of diarrhoeal attacks leading to this staggering total of deaths is even more overwhelming: a billion or more bouts a year. In one hospital in Yogyakarta, Indonesia, fully one third of child admissions were for diarrhoea, and this holds true for practically all hospitals in developing countries. Moreover, in a study of infant and child deaths in Latin America, two thirds of the deaths by infection were found to be caused by diarrhoea.

Such totals are too large to be truly comprehended. And a problem so daunting could tempt even the well-meaning to give up. But there is a solution at hand, one so simple it seems almost too good to be true.

The key fact to remember is this: diarrhoea kills through dehydration. Although a great array of bacteria, viruses and parasites can cause the diarrhoea, it is not usually these pathogens in themselves but the loss of water and salt from the body that brings about death. So diarrhoea therapy does not have to entail laborious and costly searches for the pathogens themselves, nor are drugs necessary. Normal body mechanisms will fight off the pathogens within two to five days; and in any case, there is no known drug treatment for most diarrhoeal pathogens. Therapy needs only to focus on replacing the body's lost salts and fluid.

In the past, fluid replacement was considered a clinical problem challenging the finest arts of the paediatric specialist and his sophisticated laboratory. Intravenous infusions in expensive rehydration units saved the majority of those few who were within reach of such treatment. We have now learned that the same results can be accomplished using ordinary sugar, salt and water mixtures, costing only a few cents, and administered promptly by mouth under the most basic of circumstances. The costs and complications of intravenous treatment need never enter into the picture.

The recipe for oral rehydration salts is very simple: the critical ingredients are 20 grams of glucose and 3.5 grams of salt to a litre of water. If glucose is not available, household sugar (sucrose) will do, at 40 grams to the litre. UNICEF's packets of salts – following an agreed WHO/UNICEF formula – are a little more sophisticated: they include 2.5 grams of sodium bicarbonate (baking soda) and 1.5 grams of potassium chloride, both elements that are lost in the diarrhoeal stool. While neither of these is essential to the treatment, they improve its effectiveness. Fortunately, potassium is found in many tropical fruits, including bananas, papaya, and green coconut water.

It's a formula that belongs to the kitchen rather than the laboratory; and it has been in the making for a long time. The salt-and-water combination had been used as far back as 1849, when Dr. John Snow observed that his cholera patients improved when a weak saline mixture was injected into their veins: 'The shrunken skin becomes filled out,' he wrote, 'the countenance assumes its natural aspect; the patient is able to sit up and for a time seems well.' Only for a time – because the treatment was stopped when the patients seemed better.

It took another century and another cholera epidemic, this time in Egypt, for Dr. R.A. Phillips to recognise that the fluid replacement therapy did in fact work as long as the saline mixture was given in large volumes, matching the liquid lost by the body, until the diarrhoea stopped.

But not until the mid-1960s did Phillips and others prove the true importance of sugar. Diarrhoeal disease interferes with salt transport across the intestinal wall, but glucose transport is not markedly hindered; so the glucose carries the salt and water with it.

The dramatic impact of oral rehydration was first demonstrated when cholera swept through the refugee border camps during the 1971 Bangladesh war of independence. In one field unit, staffed by paramedics under the direction of a doctor, as many as 3,000 patients were treated in three weeks. Up to 200 new cases were admitted daily to a centre where even the space on the mud floor was covered in purging patients. Two out of every five patients were children, some in coma.

Usual nursing procedures were impossible. Intravenous solutions were saved for those in profound shock and oral rehydration was administered to the rest.

Despite the inevitable confusion, the death rate was a startlingly low 3.6% and half that rate was attributable to patients who died on admission before rehydration could be attempted. By contrast, the mortality rate of the few who made it as far as the established hospitals was 25%. Even under hospital conditions in Italy, when just 278 patients were treated for cholera in 1973, the death rate was 9%. In other words, oral rehydration therapy is not just a cheaper and more available treatment; it is also – in almost all cases – the *best* treatment.

The other advantages of oral rehydration therapy are several. The salts are very cheap – even the individually foil-wrapped UNICEF packets cost only 6–8 cents, and bulk-bought quantities distributed at community centres in plastic bags, folded paper, or banana leaves work out at 2.5 cents a packet. The ingredients are easily available everywhere in the world. The dangerous side-effects of intravenous therapy – cardiac failure through rapid over-rehydration, for instance, or sepsis due to contaminated fluids – are so rare as to be almost unknown in oral therapy. And, most important of all, the treatment can be administered by non-professionals. Parents themselves can give it to their children as soon as the illness begins.

Britain's leading medical journal, *The Lancet*, described the discovery that glucose accelerates the body's absorption of salt and water as 'potentially the most important medical advance this century'. But that tricky adverb, 'potentially', points to the second major difficulty in vanquishing the killer diarrhoea.

It is near-miraculous news that oral rehydration salts are an effective enough medicine to treat 900 million or more of the billion bouts of acute diarrhoea each year, provided the treatment is started early and then kept up – but it can only cure those sufferers who have access to it. How is a mother in a remote village in a developing country to know that a remedy has been found to cure her child's sickness?

When diarrhoea strikes in its most violent form, as cholera, the world sits up and takes notice. And there is usually a rush to try to provide medication. But most of the billion bouts of diarrhoea go unnoticed; each episode seems only a matter for individual discomfort. The medication remains at the health centre. And as a mother whose infant has a loose bowel movement is no more likely to drop all her work and rush the child to a health centre than you or I are to take a day off work and hang around the doctor's surgery every time we have a headache, the gap between the remedy and the illness remains.

The mother will, perfectly reasonably, trust that the child will get over the diarrhoea in a few days – it's happened often enough before. And she will also recognise that giving the child something to drink results in more and messier stools, so she withholds food and liquid to 'let the stomach rest'. The child's own inclinations appear to confirm her actions: he is fussy and off his food.

Unfortunately, this commonsense approach doesn't accommodate certain vital realities. One is that withholding fluid deprives the child's body of the very liquid he most urgently needs. Although

Oral Rehydration:
A statement from WHO and UNICEF

Excerpts from:
The Management of Diarrhoea and Use of Oral Rehydration Therapy,
A Joint WHO/UNICEF Statement,
World Health Organization,
Geneva, 1983

○ In 1980 in the developing countries, an estimated five million children under 5 years of age – about 10 every minute – died as a consequence of diarrhoeal disease (*mostly as a result of dehydration*).

○ Oral rehydration therapy (ORT) can prevent and correct this dehydration and thus prevent many of these diarrhoea-associated deaths. This technological breakthrough offers important new possibilities for reducing the number of deaths in children because it can be used throughout the health care system and can even be administered in the home by family members.

○ Diarrhoea is also a major factor in the causation or aggravation of malnutrition... Such malnutrition is itself a contributing cause to the high number of deaths associated with diarrhoea in childhood. Thus, continued feeding, both during and after a diarrhoea episode, is an important part of the proper management of diarrhoea, complementing ORT.

○ ORT is a simple, inexpensive, and effective therapy; ensuring that it is widely available and widely used is a major public health challenge. WHO and UNICEF, as well as numerous international, bilateral, and voluntary agencies, are now collaborating with many countries in establishing national primary health care services which include diarrhoeal disease control programmes with ORT as their cornerstone...

○ A rational response to diarrhoea is as follows:

(a) To *prevent* dehydration using solutions prepared from ingredients commonly found in the home ('home remedies'); this should be the first response;

(b) To *correct* dehydration using a balanced, more complete, glucose-salt solution; ORS [oral rehydration salts] is the universal solution of this type recommended by WHO and UNICEF;

(c) To correct severe dehydration (usually defined as loss of 10% or more of body weight) by intravenous therapy; this method should also be used in patients who are unconscious or unable to drink.

○ About 90–95% of all patients with acute watery diarrhoea, including infants, can be treated with ORS alone; in the remainder, most of whom have severe dehydration or are unable to take fluids orally, intravenous therapy is required to replace the deficits rapidly... In contrast to intravenous therapy, ORS can be given under simple conditions and does not require any special equipment or highly skilled personnel...

○ While the use of ORS may *initially* require more health workers' time to train mothers to give ORS to their children, in the long term it frees hospital and health centre staff for other duties. Of greater importance, ORS involves parents directly in the care of their children and presents an excellent opportunity for health workers to communicate important health education messages on diarrhoea prevention and nutrition.

○ ORS is associated with very few side effects ... [and] has been found to be remarkably safe.

○ In a number of research studies the use of ORS for treating dehydrated children at the community level has decreased the number of deaths from diarrhoea by as much as 50–60% over a one-year period...

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giving the salts may increase the stooling, or even vomiting, for 12–36 hours, from then on it will diminish the diarrhoea. And it is important to start rehydrating the child as soon as possible; by the time a worried mother feels she must take her dehydrated child to a doctor it is usually too late for simple remedies – or indeed for any remedy at all.

The second reality is that even if the child pulls through this episode of diarrhoea and appears to be his normal self a few days later, the illness will in fact have cost him dearly. Every day of fasting will have lost him 1 or 2% of his body weight.

Part of the loss will be due to his mother's withholding of food, and to his own disinclination to eat. In addition, the diarrhoea will have reduced the absorption of nutrients from what little he does eat. And his body will have used up its meagre stores of energy to recover from the illness.

The resulting diminution in the child's growth will not be visible to the naked eye. But it is a severe blow to his nutritional status. And each blow of this kind will make him that much more vulnerable to another attack of illness – perhaps to a similar dose of diarrhoea in a few weeks' time. But this time diarrhoea could be fatal.

Or perhaps the next illness will be measles, or just a cold – the final straw will be identified as the 'cause' of death; the weakening of the child through successive bouts of diarrhoea may not be recognised as playing its deadly part. Since a child sick with diarrhoea is more likely to become malnourished, and a malnourished child is more likely to catch an infection, a terrible downward spiral is in operation, leading ultimately to death.

In the developing world, where a child may average three or four bouts of diarrhoeal infection a year, being ill can seem the norm rather than the exception. Before the child has a chance to recover fully from one illness, he will be laid low with the next: one step forward, two steps back, until he is too weak to make any more steps forward.

This vicious synergism of malnutrition and infection must, therefore, be resisted with an equally determined and powerful synergism of services: both the infection and the malnourishment must be addressed, so that each intervention enhances the impact of the other.

Oral rehydration can halt the immediate effects of one kind of malnutrition – the loss of water and salt from the body. But to counteract protein-energy malnutrition, the mother must encourage her child to eat. In the case of a baby, she must breastfeed more, not less. Fortunately, nature has organised the body so that it can gain weight at up to several times the normal rate in the convalescent period (that doesn't require the child to consume several times as much food – double the usual calorie requirement and a relatively modest protein intake will achieve maximum growth rates). A full recovery will then only take one to two days for each day of illness.*

But can poor families afford more food for their sick children? On their own some families are simply too poor. But the benefits of community mothercraft centres in Haitian villages have provided a hopeful answer. Malnourished children were fed daily for four months at the centres on local food purchased, cooked and served by their own mothers under the guidance of a village nutritionist.

A year later, assessments still showed a large, positive nutritional impact on the recipient children – and, more remarkably, on 96% of their younger siblings, who weighed more than the recipient children had weighed at a comparable age. In fact, their mean weight was 3% more than that of the control group, who came from families well enough off for their children not to require nutritional therapy. Furthermore, this effect on the siblings was achieved by the mothers alone, with practical guidance but no food supplements.

This is not to deny poverty is the underlying cause of ill-health in the developing world. As E.H. Kass observed, when he noted that even a century ago infant mortality was already low in royal families: 'Clearly, rich is better'.

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*If the child is not fed (or breastfed) throughout the diarrhoea, his growth will be set back by each new attack. This setback will be imperceptible in the usual way of things, but a growth chart will pick it up, and will enable the mother to see with absolute clarity not only how her child's growth falters during an attack of diarrhoea, but also how quickly it returns to normal if she provides extra nourishment. Growth monitoring is discussed in another chapter of this report.

But emphasising the importance of specific interventions like oral rehydration therapy and extra feeding during convalescence in no sense runs counter to broader political efforts to decrease poverty and improve social conditions. On the contrary, it is a way, so to speak, of jumping these children temporarily into a higher economic bracket. At least as far as their health is concerned, children with access to oral rehydration therapy and convalescent feeding will be 'richer' during their crucial, formative years. And a bright-eyed child with energy to learn will benefit more from other social and political interventions – like education, for example – than a sick child using all its energy to survive.

The present problem facing health educators, then, is not a technological one: a remedy exists that is both medically and socially relevant. The problem is one of communication.

Health systems are usually passive entities: they wait for their patients to come to them. But, as we have seen, mothers do not perceive childhood diarrhoea as a dangerous disease that warrants approaching a health centre. Indeed, some Javanese mothers who were interviewed believed it to be a sign of intellectual attainment. How is this cultural divide to be overcome?

The health educator's usual approach is to challenge and replace the beliefs of the target group – a slow, thankless and often inappropriate task. But there is another method: do as the advertisers do. Instead of assaulting deeply held beliefs, one can ride on concepts that already exist. It is not essential to persuade mothers that diarrhoea is a problem of sodium transport in the intestinal wall – only to persuade them that *drinking is the right response for diarrhoea.*

Different concepts of diarrhoea drawn from several cultures suggest a variety of 'marketing strategies' to validate the idea of drinking:

○ Diarrhoea is a cleansing of the body. Fluids are washed through, removing bad elements. Drink to replenish water, the cleansing element of the body.

○ Think how weak plants become during a drought. During diarrhoea, the body also becomes dry as water goes out. Like any growing thing, the body needs plenty of water for strength.

○ Diarrhoea is a 'hot' illness and results from an imbalance of forces in the body. Restore the imbalance with a drink that has the appropriate 'cold' response.

Once the concept of drinking is institutionalised, it is relatively easy to move on to what the most appropriate drink would be.

Communication also involves changing the perceptions of other members of the culture in which the mother and child live. It implies reaching decision makers at village meetings, in local women's groups, and opinion leaders among the working classes. And the involvement of young people through schools can mean the oral rehydration message being delivered into almost every home.

The mass media – billboards, radio, television, newspapers – can also spread the word that drinking is the right response for diarrhoea.

But it is foolish to create a demand for a product that is insufficiently available. UNICEF now produces over 20 million packets of oral rehydration salts a year, and up to 60 million are locally produced. But even that is clearly only a fraction of the quantity needed to reach 500 million children at risk in the developing world. The major source of rehydration salts must be mixtures prepared at home by mothers, either approximations of the UNICEF mixture or mixes based on traditional home remedies.

Recent experiments show that some traditional remedies, like carrot soup and rice-water, are on the way to being effective means of oral rehydration. Starch is a polymer of glucose, and studies show that it may be ideal for diarrhoea treatment. When starch-based solutions are given in combination with supplemental feeding, the fluid is absorbed faster, the stools are less, the diarrhoea stops sooner, and the child may even gain weight.

Initial scepticism about the ability of mothers to prepare accurate enough rehydration solutions from household ingredients is abating; studies from around the world show that poor teaching methods rather than the mothers' abilities are usually to blame for failures. For example, when more than one and a half million Bangladeshi mothers, almost all illiterate, were taught to make a solution with unrefined palm sugar, coarse sea salt and drinking water in a common household vessel, monitoring showed that 98% of the mothers could remember how to prepare an acceptable solution.

In Indonesia, a plastic spoon was given to mothers as a measuring aid for making up a glassful of mixture. One glassful, the simple message went, was to be given to the sick child for each liquid stool. Even a year later, the solutions the mothers made up with this spoon were as accurate as those made up from the ready-made packages. And the plastic spoon served another important function. On it was printed a reminder: 'After five glassfuls – seek a health post.'

In the task of reaching *all* children, the mother is the most important primary health worker. She it is who is present throughout her child's illness. She it is who cares for this child above all others. The obligation placed on all of us – government officials, doctors, health educators – is to do everything we can to help the mother to help her child in the fight against childhood's worst enemy. To do less is to waste the one asset beyond price: the mother's commitment to the well-being of her child.

Growth Monitoring

by David Morley

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Health professionals have still to convince politicians that growth in early childhood is the basis of national development. In many developing nations, up to a quarter of all children are malnourished. Many die. Many more will be physically stunted, ending up no more than 150 centimetres or five feet in height. Worse still, inadequate brain growth is likely to make schooling difficult and many malnourished children will grow up without the degree of mental development necessary for life in the twenty-first century.

Nor have we in the health services been able to convince the politicians that health care systems can materially improve the mental and physical growth of small children. Yet in several parts of the world, it is now being shown that even within existing health budgets – or for very little extra in the way of resources – the growth of children can be significantly improved.

The piece of 'technology' which makes this possible is a simple cardboard or thin plastic growth chart, kept by the mother, and costing between two and ten cents. Through the regular monthly weighing of all young children and the entering up of the results on a growth chart, children at risk of malnutrition can be identified. With the appropriate help and advice from health workers, parents can then protect the development of their children. And in so doing, they can protect and improve the economic and social development of their nations.

This revolutionary potential of the child growth chart is not, as yet, widely understood. In part, this is because malnutrition itself is not widely understood.

It is still commonly believed, for example, that malnutrition is caused by lack of food and particularly by lack of protein. Yet in perhaps half of all cases of child malnutrition, infection is the prime cause. Measles, whooping cough, tuberculosis, and especially frequent bouts of diarrhoeal infection, along with fevers, respiratory infections, and internal parasites, can all contribute These illnesses depress the appetite, consume the energy, drain away the body weight of the child, and lead to malnutrition.

In addition, the gruel or pap eaten by most small children is so bulky that the child may need to eat a kilogram of this each day to satisfy nutritional needs. Even children with no infection cannot eat this amount. This leads to an energy or calorie deficit not found in more developed countries where oils, fats, and energy-dense weaning foods are available. Because of this, many millions of children are malnourished, even in homes where adequate food is available.

A third major cause of malnutrition is the lack of everyday nutritional knowledge – knowledge about the superiority of breastfeeding over commercial formulas, about when and how to begin weaning, about how to make the best diets out of available resources.

Malnutrition must therefore be tackled on three fronts – by increasing available food, by better protection against infection and illness, and by more education.

A second great misconception about malnutrition is that it is an obvious and visible condition. In practice, most mothers of malnourished children do not know that anything is wrong. Their children's growth curve may be flattened and their growth permanently stunted, but as nearly all the children are like this, the parents consider this lack of adequate growth to be normal.

A child who is malnourished will conserve his or her energy for survival and growth. There will be little or none to spare for play and exploration. So just at the time when a normal child is becoming really mobile and active, the malnourished child is cutting down on activity in an attempt to preserve normal growth. That is why so many children in the developing world are found sitting about or standing still rather than dashing around learning through play (see Figure 2.1).

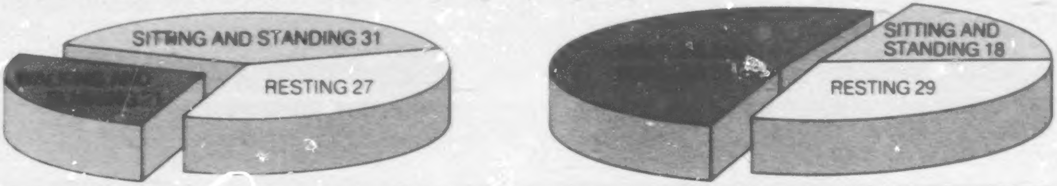
The result is that the malnourished child is also deprived of the stimulus and the interaction with the environment which is also vital for his or her mental development. And there is increasing evidence that the lowered potential which results may be permanent.

But for most children, inadequate food and health care will also mean that some growth is sacrificed. According to the latest figures from the World Health Organization, for example, there are now almost 40 million children in the world who are 'wasted' with weights below the minimum weight-for-age.

The essential value of the growth chart in combating this tragedy, is that it makes malnutrition visible to the health worker and others in the

Fig. 2.1 Estimated energy expenditure of African and European children

Calculated from observed activity and expressed as kcal/kg body weight/day



TOTAL ENERGY EXPENDITURE
AFRICAN CHILD = 79 UNITS
(UNIT = kcal/kg bodyweight/day)

TOTAL ENERGY EXPENDITURE
EUROPEAN CHILD = 98 UNITS
(UNIT = kcal/kg bodyweight/day)

Source: Davies, T.P., Parkin, J.M. (1972) 'Catch up Growth Following Early Childhood Malnutrition', E. Afr. med. J., 539-42 (88)

A European child may spend up to two and a half times as much energy on walking and running as a child in a malnourished community in Africa. The reduced activity of the malnourished child comes at a time when play and exploration of the environment is important in the development of physical and mental skills.

home who can understand the symbolism of the chart. Each month, the child should be weighed, either at the clinic or in the home or at any regular meeting of mothers. Strong inexpensive market scales are adequate for the purpose, and health care workers do not need lengthy or complicated training to weigh young children, although teaching them to complete and interpret the growth chart so that they can give advice does take time.

This process of regular monthly weighing will reveal whether or not the child is steadily gaining in weight. This is the single most important indicator of a child's healthy, normal development. If the child does not gain in weight from one month to the next - or, worse, if weight is actually lost - then the chart will make this apparent to the health worker and she can explain to the mother what needs to be done. For most children this will involve increasing the 'energy density' of the food by adding oils and fats if these are available. Instead of eating a kilogram of food a day, the child needs to get the same energy from 500 grams. In as many as half of all cases of child malnutrition, it is the invisibility of the problem rather than the lack of food in the family which is the principle constraint on improving the nutritional status of the child.

For the health worker, the growth chart represents a valuable opportunity to discuss child health and nutrition with each individual mother, and father where possible. Through the growth curve the health worker can identify when growth is inadequate and mothers can also come to understand more about malnutrition - and about the relationship between health, diet, infection, and growth.

A child who has just had measles or suffered an episode of diarrhoea, may well have lost weight from one month's weighing to the next. Understanding that it is infection which is the cause, can lead to a mother understanding the health worker's advice about the necessity of continuing feeding even during diarrhoea; about the use of oral rehydration solution; about the importance of measles immunization or the introduction of weaning foods. It is this informed involvement of the mother in the struggle to make sure that the child puts on weight each and every month which is perhaps the greatest contribution the growth chart can make to child development and child health.

At no time is this more important than when weaning begins. At the age of approximately five or six months, breastmilk alone may no longer be sufficient. Supplementary foods must be introduced as soon as the growth curve falters. The growth chart is the best indicator of when a supplement should be added. Enthusiastic mothers in more developed countries are demonstrating that they can successfully breastfeed beyond six months; their children gaining weight adequately and not showing signs of anaemia or other problems. But in developing countries where supplementary foods often have to be prepared with unclean water in inadequately washed containers and in an environment seriously contaminated with children's and animal's excreta they bring with them a very substantial increased risk of infection and consequent malnutrition. It is for this reason that so many communities postpone weaning until the child is one or even two years old. But by that time, malnutrition in the form of stunted growth is certain.

For the child whose growth is being charted, however, it is obvious when supplementary feeding should begin. And with the assistance of a health worker, the right supplementary foods can be chosen and perhaps advice can be given on how to prepare and store them safely. In this way, many of the dangers of these especially vulnerable months may be avoided.

In the developing world, growth charts were first used in the village study of children in West Africa. Their use is now spreading, albeit slowly, throughout the developing world and a collection of 280 such charts has recently been collected and analysed by the Institute of Child Health, University of London. The results - and suggestions for appropriate chart designs - are available from the Institute*. (See examples of growth charts on page 24)

On the more recent charts the child's weight is not compared with growth lines representing an

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*Institute of Child Health. University of London, 30 Guilford Street, London.

'average' child (a method which may be unnecessarily worrying to the mother). Instead, the chart emphasises only the child's own weight gain from month to month. On some, there are two growth lines and the child's own curve should simply run parallel to them, whether above or below. On others, the range of normal growth is depicted by a rainbow curve of five different coloured bands. Each child is said to have his or her own colour and should grow along it. Mothers are then taught that a rising line means a healthy growing child, a level line indicates that more appropriate food is needed. A falling line is a danger sign which usually indicates that more food and a health worker's advice are urgently required. Mothers need to be encouraged to feed their children more during and after infections. So often the maldistribution of resources, between North and South, within countries, and even within the community and the family, makes this difficult or impossible.

In addition to the principle task of monitoring growth, the charts can carry other messages vital for the protection of child health. They have a space for recording immunizations and the age at which these should be given.

The charts may also record details which indicate whether a child is at higher risk of illness and death than the average. There is now widespread acceptance of the fact that five to ten per cent of children are in this high risk category and channelling extra care and resources to such children can significantly reduce child deaths. Low birth-weight, for example, is one of the factors which can be recorded on a child's growth chart and which indicates a significant increase in risk throughout the early years of a child's life.

A high proportion of charts also now contain information on the birth of other children into the family – as well as advice on family planning. This development is a welcome shift in emphasis from family size to family spacing – encouraging a gap of three or more years between each birth as was the tradition in almost all countries a century ago. An adequate interval between births could, in itself, do much to improve child survival and child health in the developing world today.

Tough hanging scales from which are suspended plastic pants or a locally made basket, are now widely used to weigh children. A new development is to have a pointer on the back of the scale. Instead of recording the weight as the pointer on the front does, this pointer which faces the mother moves over a drawing suggesting how long the child should be breastfed or when he will stand and walk. It is hoped this will make the weighing process more interesting and meaningful to the mother and help in health education.

Growth charts can also, of course, be used to record other body measurements. In emergencies – for example, in famines or in refugee camps – the height-for-weight wall 'thinness' chart is particularly useful. The child is first weighed and then asked to stand in front of the wall chart so that his or her head is in the right column for the child's weight. If the top of the head reaches into the red area then it is likely that the child to too thin and is 'wasted'. If the top of the head only reaches to the green area in the column, then the child's weight is appropriate for its height. Such charts can be used to identify children and families who need supplementary feeding.

Finally, charts are also now being developed to monitor child growth even where weighing scales are not available. Of these, perhaps the most useful are the charts based on measuring arm circumference.

Thanks to pioneers like Dr. Shakir and Dr. Echeverri and others, the arm circumference band has now been refined and is likely to become increasingly popular over the next few years. This simple insertion-tape is placed around the upper arm and, as it is drawn tight, a plastic cursor is moved along the tape. Tape and cursor are then placed flat on the growth chart. The edge of the cursor now indicates the arm's circumference and a dot can be put on the chart. Using this method, even partly-literate health workers can maintain an adequate growth chart.

The great advantage of the arm circumference charts is that measuring tape is light and cheap compared with weighing scales. The plastic tape costs only a few cents and can be carried into every home – thereby opening up the possibility of reaching those in all societies who do not attend clinics and whose children are at particular risk.

The use of growth monitoring as an aid to child health and child development is taking off in certain countries. In Indonesia, for example, 2.5 million young children are now being regularly weighed each month under a nutrition programme which is now receiving the assistance of the 7,000 family planning workers who have so successfully brought the knowledge and the means of family planning to the majority of Java's 100 million people. In Thailand, growth charts now regularly record the growth of over a million under-fives. In Pakistan, children are now being regularly weighed at 1,500 Maternal and Child Health Centres and the idea is soon to be introduced by a further 1,000 Family Centres and several non-governmental organisations.

Despite these advances, only a small minority of the world's young children are being regularly monitored for normal healthy growth. As the network of primary health care and community development workers expands, this proportion is increasing. But part of the problem is that the concept of following a child's pattern of growth as a curve on a graph is not easily accepted by many nurses and doctors. There are several reasons for this – including the fact that medical education is still orientated towards the management of relatively rare conditions and towards curative care in large institutions. There seems to be a regrettable lapse of 10 or even 20 years after the introduction of the growth chart idea before it becomes part of a health worker's education. Unfortunately, the use of simple growth charts is still not taught to the majority of medical and nursing students across the world.

Lastly, growth charts are valuable as a source of standardized information which can paint a larger picture of community health. Properly managed, this information can help local authorities and national governments to identify districts most in need of assistance and to evaluate the impact of development programmes. Collectively, the information gained from growth charts can also help to measure the effect of irrigation schemes or crop failures. And as a sensitive measure of nutritional status, varying even from month to month, they can act as an early warning signal for an impending famine.

The supportive relationship between growth charts and primary health care is a reciprocal one. Growth charts, kept and used by the mother, are a way of informing and involving a community's parents in the promotion of health. At the same time they can be a catalyst for the acceptance of, and support for, primary health care programmes themselves.

For all these reasons, the potential impact of growth charts is nothing less than revolutionary. But from all the experience gained through the use of growth charts in the many different nations, it is clear that the chart can only be truly effective if used as one of the tools in the community health programme. Outside that context, it is simply just another good idea. Both the backing of the health services and the participation of the community – and especially the mother – are necessary for growth monitoring to make its contribution to the development of children – and of nations.

Expanded Immunization

by Ralph Henderson

Ralph Henderson has held several senior posts with the Center for Disease Control in the United States. From 1966 to 1969 he was Deputy Chief of the Smallpox Eradication/Measles Control Program for West Africa. He joined the World Health Organization's Expanded Program on Immunization in 1977 and became its Director in 1979. In 1981, he was appointed Assistant Surgeon-General of the United States Public Health System.

With each passing minute, ten children die and another ten children become lame, deaf, blind or mentally retarded from six diseases which can be prevented by immunization: diphtheria, whooping cough, tetanus, measles, poliomyelitis and tuberculosis.

Only rarely does any of these kill a child in Europe or North America. But in the developing world, measles kills some two and a half million children a year, whooping cough claims the lives of a million and a half more, and tetanus still remains unchecked, killing another million newborns every twelve months. Tuberculosis remains a major problem in most developing countries and diphtheria strikes in isolated but lethal epidemics. Meanwhile, almost 30 years after the vaccine to prevent the disease was discovered, half a million children in the developing world are still being crippled by polio each year.

These six killer diseases are now the target of the Expanded Programme on Immunization (EPI), a world-wide enterprise in which WHO, UNICEF and many other organizations in almost every nation of the world are now collaborating. The overall aim of the EPI is to make immunization against 'the big six' available to all children in the world by 1990. At the moment, only about 20% of the 100 million children who are now born every year into the developing world are being immunized.

Five years after the launch of the EPI more than 130 countries and areas in the developing world have launched their own EPIs to the standards agreed by the World Health Assembly. Over 100 of these countries are now reporting the incidence of all the EPI diseases and 116 are now reporting the percentage of children under one receiving immunization protection. World-wide, more than 1,000 senior national and international staff have participated in intensive EPI management courses and a total of more than 10,000 middle-level managers have been trained. Many countries – including notably the Congo, Gambia, Kenya, Mozambique, Tanzania, Sierra Leone, Sri Lanka, Thailand and India – have made very considerable progress.

But overall, the EPI is not on target. The goal of immunizing all children in the world in the seven years between now and the target date of 1990 is threatened. And if the targets of EPI are not achieved, then it is certain that the goal of 'Health for All by the Year 2000', surely one of the greatest aspirations ever set before mankind, will not be achieved either.

With the technology already available, why is immunization coverage spreading so slowly? There are many answers and many different problems in different countries. But there is also one constant theme running through them. The great problems facing EPI now are not technical or scientific – they are human and organizational.

Proof of that most central truth about the present status of immunization in the world has been provided by the achievements of the People's Republic of China where, in recent years, an excellent immunization service has been established on a large scale *with existing technologies.*

In most other parts of the developing world, where almost exactly the same technology is available, immunization has reached a far smaller proportion of children. And the main difficulties have not been in vaccines or cold chains or syringes or needles but in commitment, organization, training and management.

The government funding for EPI activities is usually inadequate. The right quantity and quality of staff may not have been recruited. Training may not have been adequate. And those who are trained may not have been given the responsibility and authority to see through the tasks essential to a programme's success. Supervision may be so weak that immunization staff are not held accountable for their performance. Training and supervision may become more and more dilute as it reaches out from the national level.

Parents – and their communities – may remain unconvinced of the need to bring their children back for the three or four immunizations necessary for full protection. These are the common failings which restrict the reach of immunization's arm.

The training of 12,000 national and international staff by the EPI is an important start. But few national programmes have so far developed the ways and means to pass on the necessary technical and supervisory skills to hundreds and thousands of middle- and lower-level health workers who must ultimately carry out the immunization programmes on the ground. That is why the World Health Assembly, reviewing the overall progress of the EPI in 1982, identified the lack of human resources in general and management skills in particular as the main programme constraints.

To organise, on a continuous basis, the immunization of several million children during their first year of life whether they be in city slums or desert camps or mountain villages is a management problem of formidable dimensions. Add to it widespread illiteracy, inadequate roads and transport systems, rising fuel prices, budgetary cutbacks, lack of electricity for cold storage of vaccines, and over-stretched health services often reaching only 25% of the population, and we begin to see the true scale of the difficulties facing those involved in expanding immunization. And it is against the sheer scale of those difficulties that the present threats to success should be seen.

More and stronger management is therefore necessary for accelerating the EPI's progress. But there remains the question of what the managers are to manage. Immunization services are only part of the answer. The great severity of the vaccine-preventable diseases in the developing world is due to a vicious cycle of infection and malnutrition, with either factor capable of initiating the cycle. Children often have their defence mechanisms compromised from the start by low birth weight, and then are assailed by a series of stresses which include whooping cough, measles and weaning on top of repeated episodes of diarrhoea and malaria. Each event sets the child back in growth and development and, if the interval between events is too short, the child cannot recover and dies.

Immunization services alone can be a good entry point for the development of other health services, because they are simple to administer and do not require a complex change in attitudes or life-styles on the part of the mother or the child in order to be effective (other than the changes required to obtain the immunization service itself). By preventing specific diseases which can precipitate malnutrition (especially measles and whooping cough), and by permitting children longer recovery periods between the events mentioned above, immunization can help break the vicious cycle and contribute more broadly to the reduction in childhood mortality.

But while immunization services can be delivered alone, they are best delivered along with other services needed by children in their first year of life, and by pregnant women: the persons who constitute the priority groups for primary health care services in the developing world. In addition to the monitoring of the growth of the child, the use of oral rehydration to treat diarrhoea and the promotion of breastfeeding, these services may include malaria treatment and prophylaxis, and counselling with respect to child spacing, nutrition during pregnancy, weaning, clean water and sanitation. Not only do such services act in synergy to break the cycle of infection and malnutrition, but the availability of each service helps promote the utilization of the other services by the population concerned, leading to greater efficacy and lowered cost per service delivered.

This approach calls for the EPI to be promoted as part of primary health care. This adds to the effectiveness of the EPI, and in this way, the EPI can directly contribute to the strengthening of the other primary health care services.

But there is an additional aspect of primary health care which is of critical importance to the EPI: the involvement of the community as an active partner in the planning, implementation and evaluation of the services. It is not uncommon in the developing world for only one half of the children who receive a first dose of vaccine to return for the second, and for only one half of those to return for a third. Even when coverage with the first dose is high, few children benefit from full protection. These high drop-out rates are particularly devastating with respect to measles immunization. Measles immunization must be deferred until at least nine months of age, to avoid the vaccine being rendered impotent by antibodies passed on to the child from the mother's own body. This is often the age at which children are asked to return for their third dose of DPT (diphtheria-pertussis-tetanus) and poliomyelitis vaccines.

If children don't turn up for that third dose, they will probably not be immunized against measles at all. Yet almost all will contract the disease and, in the developing world, three out of every hundred measles victims will die. For malnourished children, the death rate from measles rises closer to 10%.

Reducing drop-out rates is therefore obviously fundamental to the question of protecting all children by immunization. But the task is not as simple as telling the mother when and where she must return. When the child is nine months old, he or she is at the awkward age of being 'too young to walk and too heavy to carry'. It is also an age when the 'newness' of both the baby and the idea of vaccination has worn off, so the mother may not receive as much support or encouragement from her husband or her community in seeking a preventive health service for a child who may seem, at the time, not to need it. Just as important, the mother may be expected to stay in the fields, especially in the planting or harvesting season, or to carry on working to earn income or to attend to other pressing family problems. Finally, it may be a long way to the health centre or clinic for an overworked and [illegible] mother with a heavy baby. And so the immunization date goes by.

To overcome such problems requires a whole range of developments from more accessible health services to more labour-saving technology (and more equity) for women. But as far as health workers and immunization organisers are concerned, it means that all members of the community, as well as all mothers, should understand the importance of the pattern of immunizations and be involved in planning the times and places when immunization will be offered.

This partnership between health worker and community is important for all aspects of health care. If it can be successfully built around services such as oral rehydration therapy or immunization – when the beneficial results can be quickly recognised – then the partnership may be developed into more difficult areas such as the improvement of nutrition, hygiene or child spacing.

None of these problems – and they are the major problems facing EPI – will be solved by technology. But where human and organisational problems are still a long way from being solved, certain technological advances, especially when related to problems encountered in the field rather than in the laboratory, could help to reduce the demands on scarce management skills and on limited money and time. To that end, EPI has made a major investment in the development of 'cold chains' – the unbroken relay of transport and storage which must maintain vaccines at the right temperatures from the point of manufacture to the point of use.

This year, for example, 50 countries are testing a new vaccine monitoring card which is attached to each package of 5,000 doses of measles, polio, DPT or BCG (tuberculosis) vaccine. If the cold chain is broken at any stage in the vaccine's journey, chemical colour-changes on the monitoring card warn health workers that the vaccine has become impotent. For measles, a new kind of monitor, attached to the individual vaccine container, is also undergoing field trials in ten countries. Again, if the cold chain is broken at any point, a red disc on the lid of the container will turn to black.

To prevent cold chains from being broken, several new developments are now in the offing. In many countries, over 50% of the refrigerators used to store vaccines are not working because of lack of maintenance and shortage of spare parts. To help bridge these potential breaks in the cold chain, a new 'universal spare parts kit', capable of repairing most makes of refrigerator, has been developed by WHO, UNICEF and the Danish International Development Agency, and is now on field trial in ten countries. To tackle the same problem, 23 countries have this year been testing eight different kinds of solar refrigerator, powered by photovoltaic cells. Although the practical application of solar energy technology to the cold chain is still several years distant, there is no doubt that it has great potential for improving immunization coverage by providing for vaccine storage in the many areas, especially in Africa, where no other energy source is available.

Yet another approach to the 'cold-chain' problem is the present research into new and more heat-stable vaccines. Since 1981, the new generation of measles vaccines – which can be stored in a normal health centre refrigerator rather than in a deep freezer and retain their potency up to seven days, even in temperatures of up to 37°C – has been widely available. Research to develop more heat-stable vaccines for oral polio immunization and whooping cough is being pursued.

Of immense practical value are the new syringes which are just now becoming available – constructed of high-temperature plastics and capable of withstanding up to 200 sterilizations at 132°C. Open boiling water will not, of course, reach this temperature and another useful idea now being tried out is an adapted domestic pressure cooker, fitted with racks inside for holding syringe barrels and needles, which will be able to sterilize equipment at higher than boiling temperatures.

Finally, on the technological front, improved forms of present vaccines, as well as vaccines against additional diseases, including malaria, are on the way. One expects that new developments will also provide the opportunity to reduce the number of doses required to protect children against the six current EPI diseases, and this would indeed be a stride forward in reducing management problems and drop-out rates.

These then are the main technological hopes for advancing EPI. But even these developments would not make any very significant impression on the central constraint – the spread of primary health care services, community involvement in immunization programmes and the development of management skills.

Finally, EPI world-wide faces a lack of adequate finance. It is currently estimated that, all things taken into account, it costs about $5 to fully immunize a child against the six target diseases. For the foreseeable future, 100 million children will need immunizing every year in the developing world. The amount required is therefore approximately $500 million a year.

Currently, less than $100 million a year is being invested in EPI. Eighty per cent of that sum comes from the developing countries themselves and 20% comes in aid from governments and international organizations like UNICEF, UNDP and WHO. Increases in that level of support from the international community are essential if progress towards immunizing all children is to be accelerated. Most of the external funds are spent on the hardware – on vaccines and cold-chain equipment which have to be imported and paid for in hard currency. Sufficient outside support is needed to match the increasing investments being made by developing countries in staff and training and local costs, otherwise the staff will have nothing to work with, and the developing countries' efforts wasted. Increasing the funds available is therefore an important challenge for the international community, for WHO and for UNICEF – which for many years has been the major single provider of vaccines and cold-chain equipment to the developing world.

To meet the challenge of the EPI will take commitment – by parents, by communities, by health workers, by governments of both developed and developing countries and by international aid organizations. Can this commitment be won – so that no child is killed or crippled or retarded by the lack of $5 worth of immunization? Can the EPI still hope to achieve its target of making immunization available to all children in the short time remaining until 1990?

We have no choice but to try our best. For it is a sad indictment of the state of our planet's civilization when children are allowed to die in such numbers from simple things like whooping cough or measles or be crippled by preventable polio. In a truly civilized world, there could surely be few appeals as powerful to both heart and mind as the appeal to provide the protection of immunization for all children. We cannot be allowed to fail.

The Promotion of Breastfeeding

by Natividad Relucio-Clavano

Natividad Relucio-Clavano is Chief of the Department of Paediatrics at the Baguio General Hospital and Medical Center, Baguio City, and National Programme Consultant, Under-Six Clinic, for the Philippine Ministry of Health. She began her career at Baguio General Hospital in 1961 as Resident Physician, becoming Senior Resident Physician, Medical Specialist I, and then Chief of Paediatrics in 1973. The Under-Six Clinic which she founded in 1975 has now been adopted as a national programme by the Ministry of Health, and has won her a national award.

In both developed and developing countries today, health workers and scientists are coming to recognise the immense health benefits which are being denied to countless infants whose main, if not sole, source of nutrition is powdered milk formula. They are denied these benefits because they are denied a rich source of protection and nutrition – breastmilk. In many different parts of the world, substantial evidence has established both the direct and indirect relationship of breastfeeding to lower rates of illness, death, and malnutrition among children.

First of all, breastmilk is a perfect infant food, providing babies with complete, balanced nutrition. It is also a fluid with living cells which are constantly changing and adapting to the immunological and nutritional needs of the baby. It has been found, for example, that the breastmilk for mothers of premature infants has a higher concentration of proteins and immunoglobulin A than the milk of mothers of full-term infants. This natural phenomenon is vital to the growth, protection, and survival of the premature infant, whose need for protein and immunological protection is greater.

A second natural miracle of breastfeeding is the 'homing mechanism' which enables mothers to produce and transmit to their babies, through breastmilk, antibodies against infections.

Breastmilk initially appears as colostrum, a concentrated yellowish fluid measuring approximately 25 ml during the first 24 hours. The small amount and strange colour of the milk at this stage misleads many health workers and mothers into feeling anxious that the mother's own milk might not be enough to feed the baby. Because of this, many women resort to prelacteal or supplemental formula. The result is less suckling and therefore less breastmilk supply. In many cases, this process ends in breastfeeding being abandoned altogether.

In some cultures, colostrum is considered dirty and stagnant and is deliberately expressed and discarded. Some mothers discard only the first few drops of colostrum while others discard all the colostrum for three days. Meanwhile, the child is usually fed on sugar and water or on infant formula and is thereby deprived of the anti-infective cellular components in the colostrum which engulf and kill virus, bacteria, and fungi. Colostrum also contains proteins, 65% of which are anti-microbials. In the mature milk, these immunological qualities of colostrum are present in lesser concentrations. In addition, breastmilk has also been found to contain taurine in quantities 30 to 40 times greater than in infant formula. Taurine is essential to the development of brain cells.

A third advantage of breastfeeding is its contraceptive effect. The prolactin which is released into the mother's body by the act of suckling inhibits the return of ovulation and significantly reduces the likelihood of pregnancy. According to some estimates, more pregnancies are prevented by breastfeeding than by all other forms of contraception put together. So although lactation is not a reliable form of family planning from the individual mother's point of view, there is now no doubt that the overall effect on a society is to lengthen the interval between births, lower total family size, and reduce population growth.

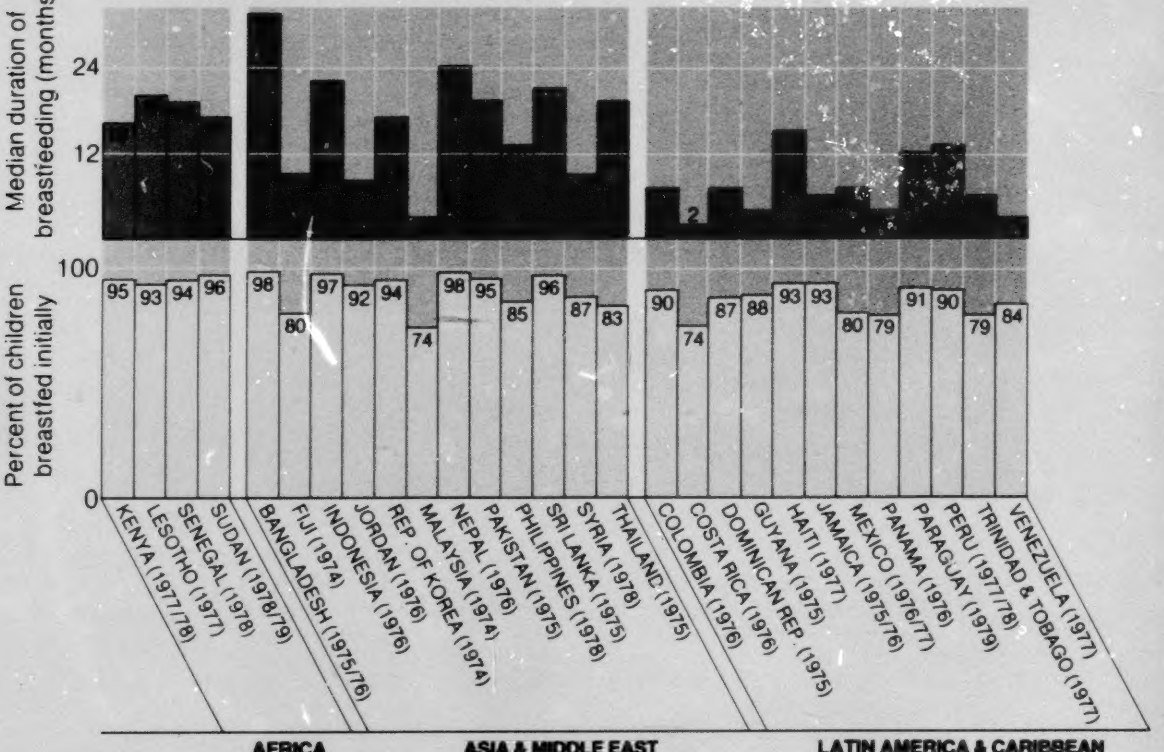
Anything which interferes with the intensity, frequency and duration of the child's suckling may therefore diminish the many different kinds of protection which breastfeeding provides. And of all such threats, the greatest is the trend towards bottle-feeding with infant formulas.

It is a threat which operates in two ways. In place of the nutritional and immunological protection of breastfeeding, bottle-feeding with artificial formula substitutes the risk of malnutrition from over-diluted milk powder and of infection from unclean water and feeding equipment. Secondly, bottle-feeding has an indirect effect on child health through its contribution to shorter birth intervals and larger family size – both of which are known to be correlated with increased malnutrition, illness, and death among the world's infants.

In spite of the many attempts to fully understand the biological, nutritional, anti-allergic and other protective properties, as well as the psychological benefits which can be derived from breastfeeding, there are still more protective and nutritive qualities of breast milk which need to be discovered. It will probably take another decade to fully appreciate all the benefits of breastmilk – benefits which neither man nor machine can duplicate. Breastmilk itself is still an enigma.

Most of this research is relatively recent. But already, it has led to a large-scale return to breastfeeding in the industrialised nations, where this knowledge has been disseminated and where the proportion of mothers using commercial infant formula had previously risen to as high as 75% in some countries. Unfortunately, the earlier decline of breastfeeding in the developed nations has set an example which is still being followed in many other countries of the world. In traditional societies, breastfeeding was accepted as the only norm for the baby's survival. But as technology and 'modern' ways encroach on feeding methods and other habits, breastmilk is eventually abandoned in favour of bottle-feeding. In my own country, the Philippines, the trend away from breastfeeding has been very pronounced throughout the urban community. A WHO study, for

Fig. 2.2 Prevalence and duration of breastfeeding



Source: Breastfeeding, Fertility and Family Planning, Population Reports, Series J, No. 24, Nov. Dec. 1981 (World Fertility Survey Data).

example, has shown that one third of mothers from economically advantaged backgrounds never even tried to initiate breastfeeding, while in the urban poor community one sixth of the mothers interviewed indicated that they had never breastfed. Furthermore, 27% of the mothers from the urban economically advantaged group, 9% of those from the urban poor, and 41% of those from the rural population were found to have been given free milk samples while in the hospital.

In the developing world, of course, the consequences of this trend towards bottle-feeding are very much more severe than in the industrialised world. To be used safely, commercial infant formula calls for access to pure water supply, means of sterilisation and refrigeration; for literacy, to be able to read and understand instructions; and for sufficient income to buy adequate amounts of the product. For many people in the developing world, however, the hygienic conditions necessary for the proper use of infant formula just do not exist. Their water is unclean, the bottles are dirty, the formula is diluted to make a tin of powdered milk last longer than it should. What happens? The baby is fed a contaminated mixture and soon becomes ill with diarrhoea, which leads to dehydration, malnutrition, and very often death. Surely our children deserve a better start in life?

Lastly, the change towards bottle-feeding also has serious economic disadvantages for the developing world and its families. In the Philippines, for example, the average expenditure for milk alone accounts for 14% of the average family income per year. To this must be added the cost of bottles, nipples, caps, and fuel for boiling.

As a result of such trends, women are losing the art of managing a successful breastfeeding relationship with their babies. Breastfeeding becomes so unnatural that they find it difficult to cope with simple problems – pain or soreness of nipples, breast engorgement and sucking difficulties of babies. Some mothers have flat or protractile nipples. But these problems can be solved if mothers understand them and have the opportunity to learn how to cope. Like any other skill, breastfeeding has to be learnt. But for many women, it has become easier to give up breastfeeding than to persevere in it.

In part, the change from breast to bottle-feeding also reflects a change in women's lives. And in order to promote the advantages of breastfeeding, we have to look into womanhood itself. Is the woman working? Does her work allow her to breastfeed? Is breastfeeding just one of too many jobs she has to do? How can I, you, the family, community, the society, the country lessen the pressure on women's energy and time and responsibility so that they can relax and enjoy breastfeeding?

When a mother becomes fully aware of the advantages of breastfeeding, she will voluntarily shift her priorities if she can. She will find time to enjoy breastfeeding her baby, allowing the luxury of an intimate, loving relationship to be developed. She will come to know the true function of her breast, not as a symbol of sex, but for her child's survival. But one of the main reasons why so many women have abandoned breastfeeding is the example set by hospitals themselves. Another has been the promotion of artificial milk by many commercial companies – fortunately a now declining number – and especially the giving away of free samples of milk powder to new mothers in hospitals and health centres. In most hospitals in the Philippines, especially in the urban areas, new-born babies are separated from their m[illegible]ers at birth, confined to nurseries, and initiated [illegible]he taste of powdered cow's milk several hou[illegible]ter birth – even before their mothers have a chance to breastfeed them. This is the way we bring children into the world.

If such policies in health units are allowed to persist, then we, the health workers, have become the tool of the offending companies in their vigorous marketing campaign.

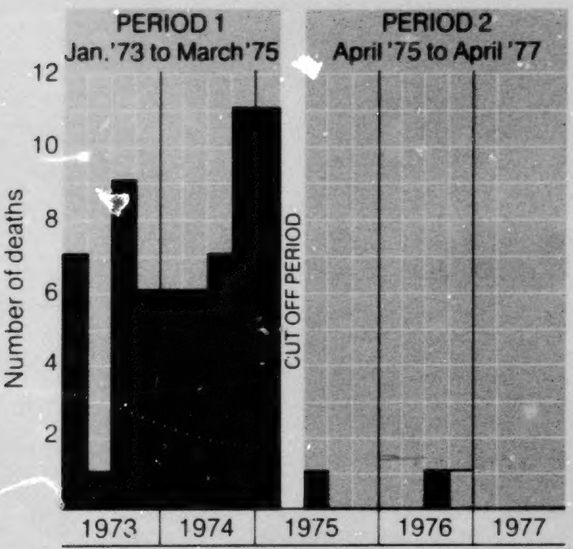
Can we allow this to happen in our midst? Are we willing to counter these milk companies' multi-million dollar campaigns with all the effort we can muster to return babies back to their mothers' breast for survival and health?

Fortunately, with the adoption of the Code on the Marketing of Breast Milk Substitutes by the World Health Assembly in 1981, many hospitals – and infant formula companies – are now beginning to change their methods.

Even so, the revolutionary task ahead of us can sometimes seem insurmountable. How many millions of mothers need to be reached, to be given adequate knowledge about, and convinced of the advantages of, breastfeeding? How do we reach them? To start with, how do we educate health workers about the superiority of breastmilk over infant formula, and motivate them to set an example by breastfeeding their own babies?

We cannot allow ourselves to be overwhelmed by these questions. Rather, let us accept them as a challenge to us all, as it was to those of us on the paediatric staff at my own hospital, Baguio General Hospital in the Philippines.*

Fig. 2.3 Infant deaths, Baguio General Hospital, 1973–1977



PERIOD 1. 4 720 live births. Babies in nursery. Almost all babies bottle-fed.

PERIOD 2. 5 166 live births. Babies in bed with mothers. Almost all babies breast-fed.

Through a reshaping of policies, and of standard operating procedures in the nursery at the hospital, we have completely phased out milk formula and bottle-feeding. We have adopted, in its place, early rooming-in and breastfeeding, a manageable and affordable policy which allows the new-born infant to be within easy reach of its mother 24 hours a day.

This practice is encouraged not only immediately after the birth but also during the time when babies are sick and need to be hospitalised. Mothers are encouraged to stay with their sick babies in order not to disrupt lactation. Even infants in intensive care units are breastfed if possible, and looked after by their mothers. In this way, a mother feels contented, knowing that her child is safe and well-fed. In this way, she learns to care for her baby and to cope with problems under the supervision of the nursing and medical staff. No infant is separated from its mother without a valid reason.

In addition, the policy of rooming-in provides a sustained intimate contact between the mother and infant during the first few days after the birth. And there is now significant evidence to show that contact between mother and child immediately after delivery strengthens the mother-child bond, and increases the likelihood of prolonged breastfeeding.

This policy has produced results at Baguio which are no less than dramatic and which show the colossal potential of promoting breastfeeding, and combating the spread of infant formula in the developing world. Over a period of four years and four months (approximately the two years before the policy change and the two years after), the results were evaluated by comparing death rates and infection rates among almost 10,000 new-born children who had been fed by different methods – breast, formula and mixed. The results showed a dramatic and significant correlation between breastfeeding and decreased death and illness in infants. Sixty-four babies died during the first period when bottle-feeding was the predominant form of feeding. Only 3 died during the second period. This represented a drop of 95% in the incidence of death among the new-born. Of the 67 babies who died, 64 were bottle-fed, 2 were breast fed, and 1 was on mixed feeding. From 1975

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*Baguio General Hospital and Medical Centre, now called the Dr. Efrain C. Montemayor Medical Centre, is an urban tertiary hospital located in the northern part of the Philippines. It has a 350-bed capacity. Its nursery has 60 bassinets and admits an average of 2,200–2,500 babies a year.

The Code:
Marketing breastmilk substitutes

Excerpts from: **The**
International Code of Marketing of Breast-milk Substitutes,
World Health Organization,
Geneva, 1981

○ The aim of this Code is to contribute to the provision of safe and adequate nutrition for infants, by the protection and promotion of breast-feeding, and by ensuring the proper use of breast-milk substitutes, when these are necessary, on the basis of adequate information and through appropriate marketing and distribution.

○ The Code applies to the marketing, and practices related thereto, of the following products: breast-milk substitutes, including infant formula; other milk products, foods and beverages, including bottle-fed complementary foods, when marketed or otherwise represented to be suitable ... for use as a partial or total replacement of breast-milk; feeding bottles and teats...

○ Governments should have the responsibility to ensure that objective and consistent information is provided on infant and young child feeding for use by families and those involved in the field of infant and young child nutrition...

○ There should be no advertising or other form of promotion to the general public ...

○ Manufacturers and distributors should not provide, directly or indirectly, to pregnant women, mothers or members of their families, samples ...

○ ... there should be no point-of-sale advertising, giving of samples, or any other promotion device to induce sales directly to the consumer ...

○ Manufacturers and distributors should not distribute to pregnant women or mothers of infants and young children any gifts of articles or utensils which may promote the use of breast-milk substitutes or bottle-feeding...

○ The health authorities in Member States should take appropriate measures to encourage and protect breast-feeding and promote the principles of this Code ...

○ No facility of a health care system should be used for promoting infant formula ...

○ Feeding with infant formula ... should be demonstrated only by health workers, or other community workers if necessary; and only to the mothers or family members who need to use it ...

○ Health workers should encourage and protect breast-feeding; and those who are concerned in particular with maternal and infant nutrition should make themselves familiar with their responsibilities under this Code ...

○ Labels should be designed to provide the necessary information about the appropriate use of the product, and so as not to discourage breast-feeding...

○ Governments should take action to give effect to the principles and aim of this Code, as appropriate to their social and legislative framework ...

○ ... manufacturers and distributors of products within the scope of this Code should regard themselves as responsible for monitoring their marketing practices according to the principles and aim of this Code ...

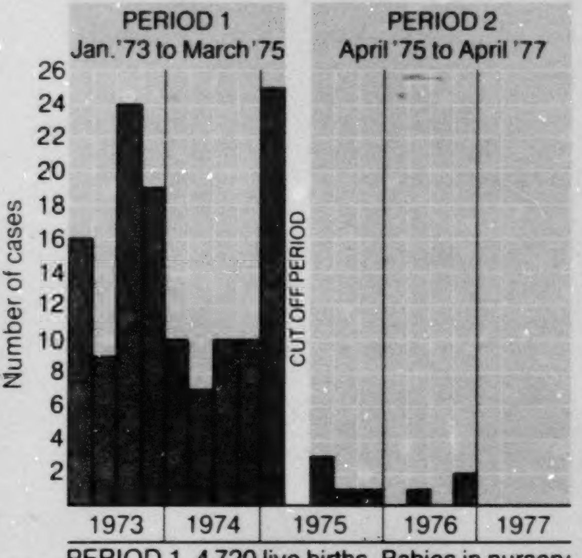
BEST COPY AVAILABLE

until the present day, outbreaks of diarrhoea have been almost non-existent, cases and deaths due to clinical sepsis have been remarkably reduced, and the occurrence of oral thrush has been practically nil in our nursery (see Figures 2.3 and 2.4).

The first three years of the campaign were difficult and trying, but we have been able to accomplish our goal. We have been able to prove that milk formula and bottle-feeding is only a man-made deviation which can and should be dispensed with. We have no need for infant formula. We have breastfeeding mothers, wet-nurses, and a small milk bank in the nursery.

Our campaign has not yet ended, for it cannot be confined to our own hospital. The Under-Six Clinic programme which we developed at Baguio was adopted as a national programme in July 1979 by the Ministry of Health and has since been assisted financially by UNICEF. Now, the Baguio Under-Six Clinic serves as a national training centre for health personnel from all over the country. Besides promoting breastfeeding by educating mothers about its advantages, the programme also includes: rooming-in within half an hour after birth; a mother-and-child room where mothers are encouraged to stay to breastfeed and care for infants who are ill; and an over-the-phone information and counselling service for mothers who encounter problems or worries in breastfeeding. Working mothers are given special attention by teaching them how to collect and store their own milk for their babies. Usually, hospital staff are able to teach breastfeeding competently because they have also breastfed their own babies.

Fig. 2.4 Incidence of diarrhoea, Baguio General Hospital, 1973–1977



PERIOD 1. 4 720 live births. Babies in nursery. Almost all babies bottle-fed.

PERIOD 2. 5 166 live births. Babies in bed with mothers. Almost all babies breast-fed.

Although the pioneering programme at Baguio has made headway in reducing deaths and infections among infants, there is still a long way to go before its hospital practices are adopted by health institutions throughout the Philippines. During the next five years (1983–1987) a concerted effort headed by the Ministry of Health with the assistance of UNICEF will try to promote breastfeeding throughout the country. It is a programme which includes: the adoption and enforcement of the International Code of Marketing of Breast-milk Substitutes; changes in hospital routines and standard practices; motivation and information campaigns addressed to decision makers, health professionals, mothers, and the community at large; the development of health training syllabuses which include the advantages of breastfeeding; legislation to protect a mother's right to breastfeed; and the active participation of the information media.

Internationally the campaign to reverse the decline of breastfeeding is an even more tremendous challenge. Much has been written on the strategies and techniques for the promotion of breastfeeding. But although attempts are being made to pursue such programmes, many countries are starting from square one – surrounded by much confusion and guided by very little experience. What happens to those countries who need help in designing the right policies, laws, curricula, hospital routines, commercial guidelines, and promotion strategies? What can be done to help them promote breastfeeding? Surely what is now required is a strong global strategy to inspire an international network of advocate groups for breastfeeding. Such an international task force could be called upon to play a role in the promotion of breastfeeding from country to country and to extend and share their expertise in promoting and monitoring breastfeeding in all nations of the world. At stake are the lives and health of many millions of children. Let us give all our children what they deserve: the best.

Family Spacing

by Deborah Maine
and Joe Wray

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Family planning is often seen as the equivalent of population control and both are usually thought of as a response to the 'population explosion'. But even if there were no such thing as a world population problem, there would still be an urgent and compelling case for family planning.

The spacing, timing and number of births a woman has are important to both her health and that of her children. Science has only recently been able to document the validity of this simple statement, although people the world over have long accepted its truth. When 21,000 women in five developing countries were interviewed in a WHO survey, for example, nine out of ten said that the health of the mother and of her children is better if the family is small and if children are born at least three years apart.(1)

In this article, we present evidence of the profound effects of family spacing on maternal and child health in both industrialized and developing countries. In our view this health effect is one of the most important reasons for making modern methods of family planning available to all who wish to use them. Another reason is that people have a right to control basic aspects of their lives, and few things could be as fundamental as the control by women of the timing and number of their children. Ten years ago, this right to the knowledge and the means of family planning was affirmed at the World Population Conference in Bucharest. But as data from the World Fertility Survey show, that right exists only in theory for millions of the world's women because they know of no place to obtain family planning advice and supplies.(2, 3)

One of the reasons why science sometimes appears slow in establishing basic facts about health in the developing world is that it is often very difficult, if not impossible, to gather the necessary data. Furthermore, since the number of deaths is easier to measure than the 'degree of health', we have much more information on the relationship of family formation patterns to maternal and child deaths than to maternal and child health. Consequently, while much of the evidence which follows focuses on child mortality, it is essential to remember that for every child who dies as a result of health problems associated with birth spacing and family size, there are many more who are sickened, weakened, or handicapped. The same is true for every woman who dies of an illegal abortion or of haemorrhage or infection after childbirth itself.

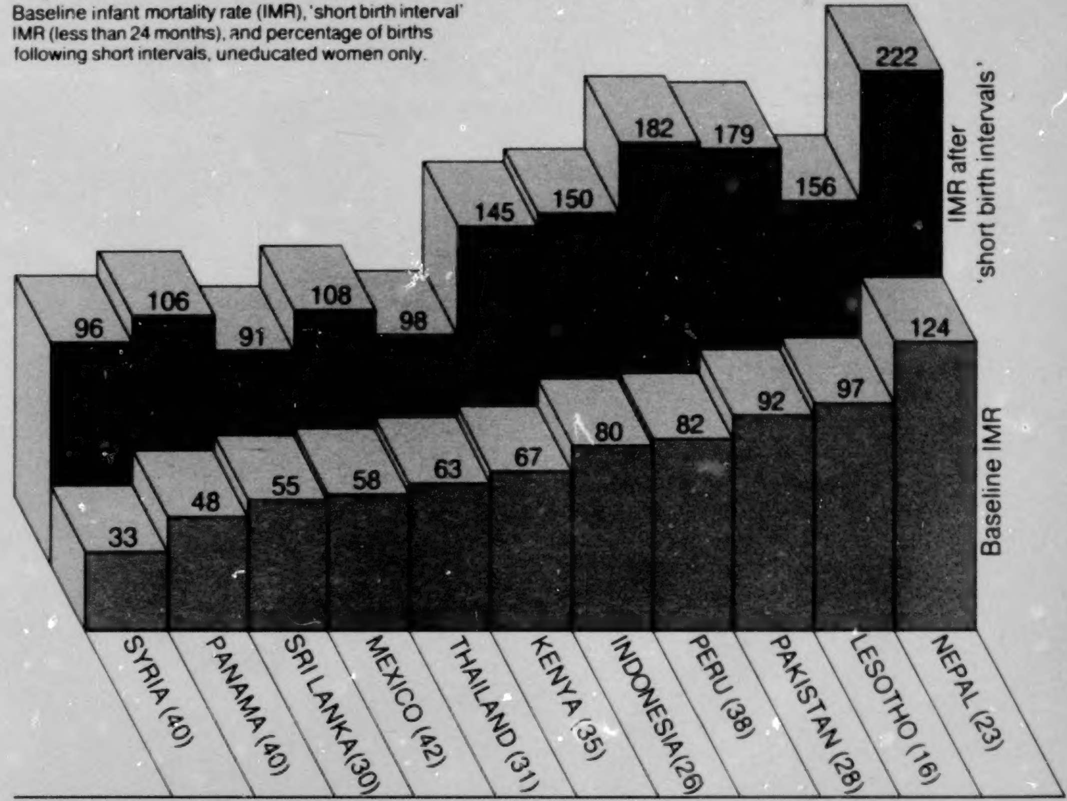
Perhaps the most important factor in the relationship between family formation patterns and child health is the length of the interval between births. In many cultures, people have long known that having children too close together is dangerous for health. 'Kwashiorkor', for example, is an African word for the malnutrition of a child weaned too early from the breast because the mother is pregnant again.(4) In recent years, scientific evidence from the World Fertility Survey has shown clearly that:—

○ The relationship between birth intervals and child health and survival is not a local or transient phenomenon. In every one of the 26 countries so far studied, there was an increase in infant deaths if the previous birth interval was less than two years.(5)

○ This increase in infant mortality is substantial. In only one of the 26 countries was it less than 50%; in the majority it was over 100%. Figure 2.5

Fig. 2.5 Infant mortality and intervals between births

Baseline infant mortality rate (IMR), 'short birth interval' IMR (less than 24 months), and percentage of births following short intervals, uneducated women only.



Note: The baseline IMR is the IMR among babies born more than two years after the birth of a previous child. The 'short birth interval' IMR is the IMR among babies born less than two years after a previous birth. Both sets of figures are for women who have had only one previous birth in the last six years.

Figures in parentheses indicate the percentage of 'short interval' births.

Source: World Fertility Survey data, 1970's.

presents a sample of the countries studied, and shows the excess mortality among infants born after short birth intervals.

○ Too short an interval between births not only raises an infant's chances of dying during its first year, it adversely affects the child's survival chances for at least the first five years of life.(5,6)

○ Short birth intervals endanger the health of the older child of the closely spaced pair as well as that of the younger. Competition for breastmilk and parental care may well be important factors in explaining this finding. Often, the death of one child will hasten the birth of the next (either because of the parents' eagerness to 'replace' the lost child or because of the loss of the protection against pregnancy which breastfeeding provides). But such cases – cases in which a short interval between births may be a consequence rather than a cause of a child death – do not explain the strong link between birth interval and survival rates: even where the older child survives until the younger is born, its chances of dying are increased if the birth interval is short.(7)

○ While socio-economic conditions certainly influence child mortality, they are not responsible for the association between short birth intervals and increased mortality. The increase in risk is present regardless of mothers' and fathers' education, season of birth, region of residence, or presence of piped water.(5, 8)

This last point is very important. While numerous studies have demonstrated that short birth intervals are associated with increased infant and child mortality, it has usually not been possible to tell whether this association was due to some other related factor such as socio-economic status or maternal education. If that were the case, of course, then the risk associated with short intervals would really be just one more manifestation of poverty. But analysis of World Fertility Survey data shows that this is not the case. While infants born into families with uneducated parents (a common measure of socio-economic status), into homes with no piped water, in slum areas, or in seasons of high mortality, *do* have higher mortality rates than infants born into more fortunate circumstances, the higher risks associated with short intervals are similar for both.

This does not explain exactly why closely spaced infants are more likely to die, but it does tell us that the increase is not simply the effect of other well-known risk factors such as poverty and illiteracy.

Unfortunately, short birth intervals are not a rare event, as Figure 2.5 shows. In two thirds of the 26 countries studied, more than 30% of all births followed an interval of less than two years.(5) In eight of the countries (all in Asia and Latin America) more than 40% of births followed an interval of less than two years. In no country was the proportion less than 15%. In three of the four countries where less than 20% of births followed short intervals (Senegal, Lesotho and Ghana), traditional birth-spacing practices (sexual abstinence and breastfeeding) are still relatively common. The fourth country is the Republic of Korea, which has had an active family planning programme for many years.

Even in countries where only 15–20% of births follow a short interval, the effects of better spacing on infant mortality would be substantial, as we will demonstrate later. However, there are other features which make birth *spacing* a particularly attractive primary health care initiative.

○ First, *spacing* births is a familiar concept in many traditional societies. While surprisingly large proportions of women say that they want no more children, in some parts of the world (especially in Africa) deliberate family size limitation is often considered an alien and unappealing idea.

○ Second, birth spacing is a concept which corresponds to the way people live, dealing with the present and the near future. How many of us really know, when we are 20 years old, how many children we will want or at what age we will wish to stop childbearing? *Postponing* the next birth for an extra year, however, is a reasonable goal.

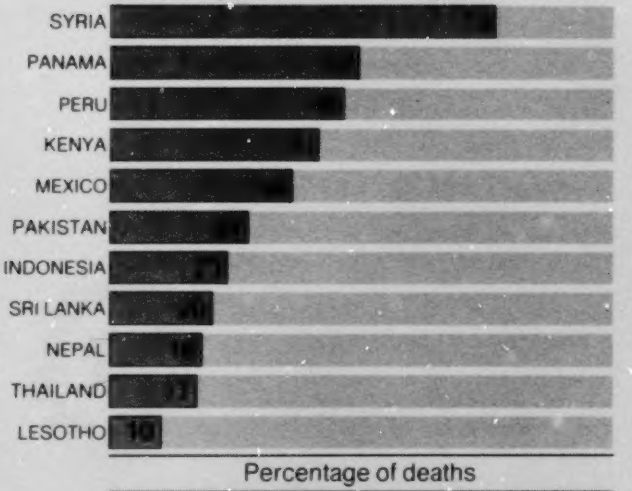
○ Third, birth spacing can be accomplished in a number of ways. For most women, the use of a modern means of family planning is probably the most practical but prolonged breastfeeding and periodic abstinence are useful as well.

Unfortunately, traditional methods of birth spacing are less effective than are modern ones. Breastfeeding helps to prevent pregnancy as well as being crucial to infant health and development (especially in poor countries). But it is not a reliable method of contraception from the individual's point of view as a sizeable proportion of breastfeeding women can become pregnant again within the first year. This is particularly true of women who feed their babies other foods (as indeed they should after about six months, because breastmilk alone is no longer sufficient to sustain normal growth). A period of sexual abstinence following the birth of a child is, by definition, an effective way of spacing births. Most common in Africa, this age-old method is now becoming increasingly rare because of recent cultural changes. As polygamy decreases and more modern ideas are introduced, for example, long periods of sexual abstinence are becoming less acceptable to both men and women.

The evidence of a relationship between birth interval and child survival is thus strong and growing. In addition, a great many studies in both the developed and developing countries have shown that the *total number* of children in the family also significantly affects child survival and child health.[9, 11]

Fig. 2.6 Percentage of infant deaths avoidable by birth-spacing

Percentage of infant deaths which would be averted if all births were spaced at least 24 months apart.



Source: Estimates based on World Fertility Survey data, 1970's

The true importance of this finding is that it coincides with the desires of many women. World Fertility Survey data disprove the common assumption that poor, uneducated women in developing countries generally want as many children as they can have or 'as many as God sends'. While it is true that only a small proportion of African women express a desire to limit the size of their families, an astounding number of women in other parts of the world are willing to tell a stranger holding an interview form and a pencil that they do not want any more children. For example, among women with three living children the proportions who said that they want no more children were 24% in Jordan; 39% in Nepal; 50–60% in Costa Rica and Mexico; and 60–70% in Bangladesh and Thailand.[12]

Figure 1.19 (page 57) shows how infant mortality increases with birth order in two very different parts of the world - El Salvador, and England and Wales.[9, 13] While rates of infant mortality in England and Wales are only a fraction of those in El Salvador (and most other developing countries) the pattern is quite similar in both and stable over time. Again we do not understand all the reasons for this pattern. But we do know that the proportion of births which result in low-birth-weight infants increases after the second or third birth.[14, 15] Low-birth-weight infants (weighing 2,500 grams or less at birth) are both more likely to die during the first year and to have more health problems than do other children if they survive.[16] In poor families, some of the effect of higher birth order certainly comes from inadequate nutrition. A study in Colombia, for example, found that the more children there were in the family, the larger the portion of the family resources that was spent on food, but the smaller the amount of food available for each person, and the higher the proportion of the children diagnosed as malnourished.[17]

In addition to the birth interval and birth order, a third family formation factor influences child health and survival - maternal age at birth. And again, the effect is not confined to the developing countries, as data from China and Britain, shown in Figure 2.7(13, 18) demonstrate. While the level of infant mortality in Britain has dropped sharply during this century, the relationship between maternal mortality and maternal age has not disappeared.(19) Furthermore, in-depth studies in the United Kingdom have found that the effects of birth order and maternal age are apparent in every social class, although environmental factors are obviously important.(19) In the United States, for example, teenaged mothers are often poorer, less educated and have less social support and access to medical care than older mothers.(20)

Part of the increase in mortality among infants born to older women is the result of congenital malformations. Data from the United States demonstrate that the proportion of infants born malformed increases drastically among women older than 30.(21) Some of these birth defects result in an infant death, while others produce lifelong disability. The rate of Down's syndrome (a severe and chronic mental and physical disability) rises exponentially with maternal age after 30.(22)

From a public health viewpoint, maternal age as a risk factor for infant health has one outstanding characteristic (as does birth order): many women in their 30s and 40s do not want any more children. Their desires are precisely in accord with rational public health policy – they don't need to be 'sold' the idea. In general, the proportions of women who say they want no more children are similar among women aged 30–34 to those among women with three living children (cited above).(12) In fact, the proportions are often higher, since many women have more than three children by the time they are 30 years old.

Much of what we know about the impact on children of spacing, timing and number of births is based on the associations with mortality described above. We also know, however, that mortality is only the tip of the iceberg. Excess deaths among children born into large families, or among children born too close together, or among children born to teenage mothers, are a clear indicator that infection and illness are also more common in these groups. While satisfactory data about the relationship between family formation patterns and the health of surviving children are more difficult to obtain, the evidence which is available is persuasive.

One of the earliest long-term studies of illness in families showed, for example, that the number of episodes of diarrhoea per person increases with family size.(23) More recently, studies in developing countries have shown a clear-cut association between family size and malnutrition, manifested by stunting of growth.(17) The WHO study of family formation found this pattern in four of the five countries studied.(1)

Some of the most impressive data on this subject were obtained in the National Survey of Health and Development, carried out in Great Britain by Douglas and his co-workers.(24–26) This study showed that children from larger families were shorter than their peers from small families by the time they were four and a half years old. The difference persisted at ages seven, eleven and fifteen. This persistence into young adulthood was amply confirmed by the study of 19-year-old males in the Netherlands, which showed a clear-cut decrease in height with increasing family size.(27)

One of the interesting findings of the British study was that there was little or no effect of family size on growth in the upper middle class. On the other hand, children from one-child families in the lowest social group grew as well as those from upper-class families. This confirms what common sense would suggest: where food is abundant (as in prosperous families) family size is not important to nutrition; where food is limited, children grow much better if there aren't too many of them.

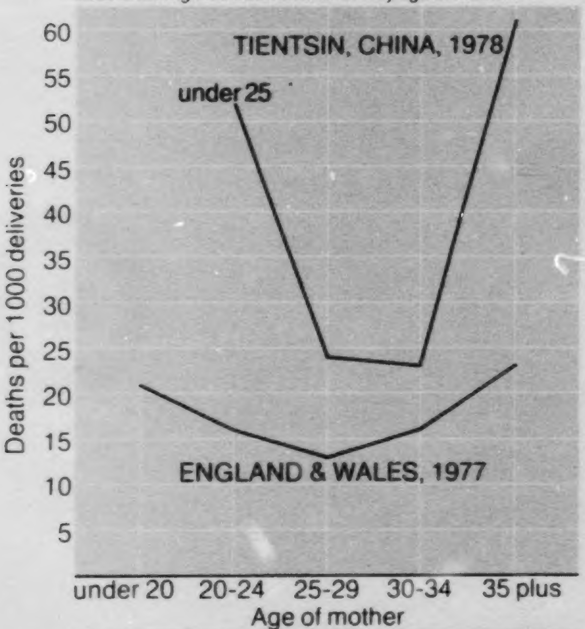
The question of family size and mental development is inevitably tinged with controversy. However, as long as we recognise that performance in intelligence tests is strongly influenced by culture and environment, test results are useful because they do reflect a child's ability to perform in school – and performance *can* be improved.

Repeatedly, studies of huge populations in Europe and the United States have shown that the larger the number of siblings, the lower the 'IQ' test score, regardless of the test used. The data are incontrovertible: a child from a large family is more likely to have a low IQ than is a child from a small family.(28) (However, it is important to exercise care in applying this or any other generalisation to *individuals*. Just because a particular child is from a large family does not mean that he or she will automatically be intellectually less able than children from smaller families.)

The study of Dutch 19-year-olds (carried out in the late 1960s) provides detailed data on almost 400,000 young men.(28) This large population allowed a level of refinement of analysis that had not been possible in earlier studies. The negative relationship of intelligence to family size (unlike the association with growth) was found in *all* social classes. Whatever the factors associated with family size that reduce a person's 'IQ', they seem to operate regardless of social classes. Furthermore, not all children in large families are affected equally: among families of a given size, test scores fell with each increase in birth order.(27)

Fig. 2.7 Deaths by age of mother

Foetal deaths during the last two months of pregnancy and deaths during first week after birth – by age of mother.



Source: K. C. Lyle, S. J. Segal, C. Chang and L. Ch'ien, "Perinatal Study in Tientsin: 1978," Int. J. of Gynaecology and Obstetrics, 18(4): 280–89, 1980.

How do family size and birth order affect intelligence? The exact mechanisms may never be known. One of the most likely explanations is that the intellectual development of a child depends to an important degree on a nurturing environment and the amount of stimulation received from the parents (especially the mother) early in life, and parents with too many children cannot provide the stimulation needed for optimum development. This explanation is also consistent with the changes associated with birth order – with each succeeding child, the mother has a little less time and energy. It is also confirmed by the observation that youngest children in a family do well if born after an interval of five or more years. Presumably this is because as the other children grow older they demand less of the parents' attention and, being more mature, can even help teach their younger sibling.(27) Thus, birth interval may be a key factor in intellectual as well as physical development.

So far, the focus of this report has been the impact of family formation patterns on the mental and physical development of children. But it is important to point out that family planning has a beneficial effect on the health of women as well.

Having a large number of children, or having births at unfavourable ages, increases the likelihood that a woman will die during pregnancy or delivery. Again, these relationships are 'J-shaped' (high among the youngest women, still higher among the oldest), and they are found in countries with low rates of maternal mortality (such as the United States and Britain) as well as in developing countries where maternal deaths are still relatively common.(10) The persistence of this relationship has been shown in Sri Lanka where maternal mortality declined substantially between 1956 and 1968(29) but where the pattern of deaths by maternal age remained. (In fact, the *relative* risk associated with advancing maternal age may be greater in industrialised than in developing countries.(10))

Probably the greatest contribution which family planning can make to women's health is through a reduction in the number of illegal abortions. Precisely because they are illegal, such abortions are not well documented. Even so, the evidence is ample that millions of women are forced to risk their health and lives if they wish to avoid unwanted births. This is a reflection of their desperate determination to plan their families.

It is estimated that more than one half of the women in the world now live where access to abortion is restricted to some extent by law. (30) More than one fifth of women, for example, live in countries where abortion is illegal except to save the woman's life. In many of these same countries it is estimated that there are more than 200 abortions for every 1,000 live births.(30) Even more troubling is evidence that illegal abortion is becoming more, rather than less common, especially in Africa.(31)

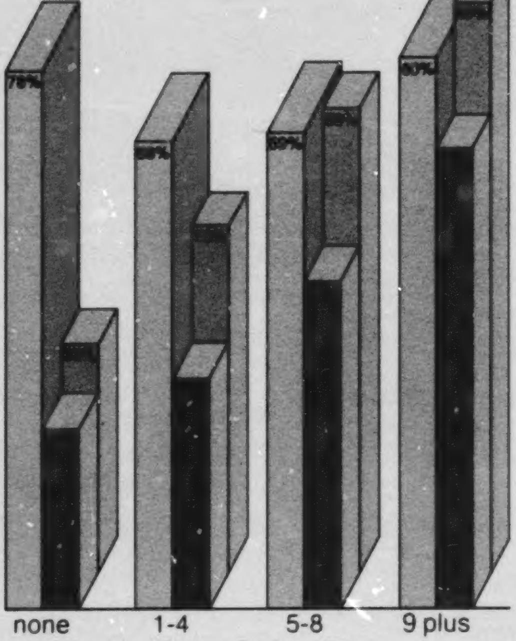
That this situation causes needless pain and death among women is obvious – most of these abortions are performed by untrained personnel, or by the woman herself, and often under grossly unsanitary conditions (except among the wealthy in the cities). It is estimated, for example, that more than 68,000 women in developing countries died from illegal abortions in 1977 alone.(32) Furthermore, the care of women who require medical treatment after an illegal abortion represents a serious drain on scarce medical resources in developing countries.(33, 34)

Such deaths are unnecessary. Studies conducted over the past two decades have shown that use of modern methods of family planning is safer than pregnancy (except among women older than 30 who smoke cigarettes) and certainly far safer than illegal abortion.(35, 36) While more and better studies need to be undertaken in developing countries, it is expected that since maternal and abortion mortality rates are highest in the Third World the effects of family planning in reducing those rates will be even more pronounced.

Improvements in maternal and child health as a result of family planning have already been documented in developed countries, and the few data available indicate that improvements occur in developing countries as well. In Chile between 1964 and 1978, for example, the proportion of women aged 15–44 who obtained help from family planning programmes increased from only 3% to more than 25%.(37) At the same time, the birth rate fell from 36 births to 22 births per 1,000 population. Most of the reduction in childbearing was among the high risk groups – teenagers and women over age 30. During this same period, infant deaths in Chile declined from more than 100 to 35 deaths per 1,000 live births.(37) Maternal deaths due to illegal abortion dropped from more than 115 to fewer than 25 deaths per 100,000 live births. Hospitalisations for complications following illegal abortions also declined sharply.

Fig. 2.8 Family planning: access and use

Percentage of women aged 25-34 who have ever heard of a place to obtain contraceptive advice or supplies, and who have used a method of contraception, by years of education, Kenya, 1977-1979.



Key

▨ Have heard of a place to obtain contraceptive advice or supplies.

■ Have used a method of contraception.

▨ Women who have used contraceptives as a proportion of those who have access to them – by education.

Note: Excludes never married women.

Source: Central Bureau of Statistics, Ministry of Economic Planning and Development, Kenya Fertility Survey, 1977 – 78, First Report Volume 1, Nairobi, 1980.

Certainly, family planning is not the only factor which affects infant or maternal health. In the Chilean example, there were other factors at work during this period. Nevertheless, the contribution which family planning can make is large. In the United States, it is estimated that fully one half of the sizeable decline in infant mortality during the 1960s was due to more favourable childbearing patterns (fewer births among women older than 30 and fewer births of children of birth order four or higher).(38)

Using World Fertility Survey data, it is now possible to roughly estimate the impact that family planning could have in developing countries. Figure 2.6 shows the proportions of infant deaths which would be averted if all births were spaced at least 24 months apart (based on the data presented in Figure 2.5). In most of the countries shown, the proportion of deaths which would be avoided by better spacing is between 15 and 50%. Few public health measures can offer such a dramatic reduction in mortality (and related improvements in health) in so short a time.

Furthermore, if all women who said that they wish not to have any more children implemented their wish, this would have an additional and substantial effect in preventing infant deaths, since the proportion of women who want no more children increases with age and family size, placing the children of such mothers also at greater risk.

Many factors determine whether a couple will decide to plan the number, spacing and timing of their children, but experience with family planning programmes all over the world has highlighted one important fact: easy access to family planning services and supplies, in itself, encourages and increases their use.(39) Yet there are still many countries where such access is limited. To use a crude but telling measure, World Fertility Survey studies have revealed that the proportion of married women who do not know of any place where they can obtain contraceptive supplies or advice is 20–30% in Malaysia and Panama; 30–40% in Colombia; 40–50% in Indonesia and Mexico; 50–60% in Kenya, and over 90% in Nepal.(40)

The importance of increasing knowledge of and access to family planning services is demonstrated by Figure 2.8. It is a truism that attitudes toward family planning in Africa are different from those in Asia and Latin America – the implication being that even if family planning services were widely available, African women would not make use of them. And it is indeed true that use of family planning is increasing more slowly in Africa than it did in other parts of the world. Nevertheless, Figure 2.8 shows that in Kenya the proportion of women who have ever used contraceptives varies directly with the proportion who know where family planning services can be obtained.(41) Women with little or no education in Kenya are less likely than other women to know where to obtain family planning services, but if they *do* know, then they are just as likely to use those services as are women with much more education. Without these data, one might look at the rates of contraceptive use and conclude that traditional, uneducated Kenyan women are not interested in family planning. This would be a mistake. Furthermore, the same relationship between knowledge of a source of supplies and advice and use of them held true when women were divided according to urban or rural residence, or their religion (Catholic, Protestant, Muslim). In all cases the majority of women in Kenya who knew where to obtain family planning advice and supplies had used them at some time.

In summary, children need healthy, nurturing mothers (and fathers, too) and society needs healthy, vigorous children. Making it possible for parents to space births properly, to keep family size within desired limits, and to avoid pregnancies too early or too late in life contributes to the well-being and the survival of women and children. Evidence from all over the world suggests that many parents *know this* – that they are, in this respect, well ahead of many policy-makers, planners, and health service providers. There is a demonstrable *need* and a large *demand* for family planning and birth spacing services. The methods are effective, safe, simple, and relatively inexpensive. Neither high-technology facilities nor expensively trained personnel are required to provide them. The policy implications could not be clearer.

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Food Supplements

by Kusum P. Shah

Kusum P. Shah is Associate Professor of Obstetrics and Gynaecology, Grant Medical College and J.J. Group of Government Hospitals, Bombay. From 1974 to 1978, she was consultant to the Kasa Model Integrated Mother-Child Health-Nutrition Project, developing simple methods and equipment for use by community workers and traditional birth attendants. In 1979, she became Expert Obstetrician and Gynaecologist to the Ministry of Health of the Somali Democratic Republic. She has written numerous papers in the areas of maternal health, child care, nutrition and low birth weight, appropriate technology for better obstetric care, and the delivery of health care.

One of the most important underlying causes of infant deaths in developing countries is low birth-weight. In total, more than 23 million babies a year are born weighing less than 2,500 grams and 90% of them are born into the developing world. Accounting for between 12% and 15% of births, but between 30% and 40% of infant deaths, these low-birth-weight babies are therefore approximately three times more likely to die in infancy than babies of normal weight at birth. But neither the incidence of low birth-weight nor the risks attached are spaced evenly around the globe. In some areas of Guatemala, for example, a third of all babies are born with low birth-weights and half of them will not live to see their second birthday. In parts of Asia, one baby in two is born below 2,500 grams and, according to a study in one rural health unit, the risk of peri-natal death is five times greater than for babies of normal weight. Even in the United States, most of the differences in infant mortality rates between whites and non-whites are directly associated with differences in birth-weights.

In the main, it is the low-birth-weight baby's low resistance, and consequently greater frequency and severity of infection, which explains its low survival rate. Tragically, the low-birth-weight baby is also more likely to become malnourished, even if breastfed. The reason is usually the same as the reason for low birth-weight itself – the very poor nutritional status of the mother. Severe maternal malnutrition adversely influences the capacity to lactate and the duration of breastfeeding.

The relationship between the mother's weight before pregnancy, her weight gain during pregnancy, and the birth-weight of the baby, has long been established. In one Indian study, for example, it was conclusively demonstrated that the major factor contributing to low birth-weight was the mother's own malnutrition – often since her own childhood. Another major cause is anaemia, which can reduce the iron necessary for foetal growth. Average birth-weights among women with haemoglobin levels of 6.5 grams, according to one study, were found to be 2.4 kilos as opposed to 2.8 kilos for women with haemoglobin levels of 10.5 grams. Investigations in India have shown that 50% to 60% of pregnant women in the lower socio-economic groups are affected by anaemia and similar findings have been reported in South America.

Just as infection plays a larger role in infant and child malnutrition than is generally realised, so its role in causing low birth-weight is also in need of more recognition and investigation. Malaria, chronic dysentery, diarrhoea, hookworm infestation, and tuberculosis, are all common illnesses among pregnant women in developing countries and they all affect birth-weight. Placental malaria, in particular, has been shown to reduce average birth-weights by between 100 grams and 300 grams.

Lastly, low birth-weight is considerably more common among babies born less than two years after a previous birth and among babies born to very young mothers whose own bodies are still growing and whose pregnancy increases the nutrient demands on both mother and child. Family spacing could therefore also play a part in reducing the incidence of low birth-weight and associated infant deaths.

But the most important factor remains the mother's own level of nutrition. Quite simply, if the mother does not have enough food in pregnancy, then the growing foetus will not receive the nourishment it needs. During pregnancy and breastfeeding, a women needs to receive approximately 2,500 calories a day. In practice, many women in the poorer communities of the developing world receive nothing like this amount. One study by the Indian National Institute of Nutrition in Hyderabad, for example, showed that pregnant women were receiving, on average, only about 1,400 calories a day or just 60% of their needs.

The result of too little food in pregnancy – often compounded by too much hard physical work – is that the mother-to-be does not gain enough weight during the nine months of gestation. And that weight gain is crucial not only to the satisfactory growth of the foetus but also to the build up of the 'energy bank' which the mother needs to draw on for childbirth, breastfeeding, and the one-thousand-and-one demands of looking after a new child. Without that 'bank' the mother's own body will become overdrawn.

In the industrialised world, that weight-gain in pregnancy is usually around 12 kilos, whereas in the developing world many women – probably the majority – gain only perhaps 6 kilos or less during pregnancy. If that pregnancy is at the 'wrong' season of the year – say, for example, the rainy season when last year's food is running low and hoeing and planting the new crop means that energy demands are high – then a woman's weight gain in pregnancy is likely to be even less. It has been observed in a Gambian village, for example, that weight-gain during pregnancy varies between 2.7 kilos and 5.5 kilos according to the different seasons.

The consequence of insufficient weight increase during pregnancy is likely to be low birth-weight. But for the child, the consequences do not stop there. Inadequate diet may also affect the mother's capacity to breastfeed – and so, tragically, the low-birth-weight infant may be deprived of adequate nutrition by the same cause which resulted in low birth-weight itself. But for the majority of mothers in poor communities, even if they are malnourished, breastfeeding is still the best way to protect an infant from malnutrition and infection. If the malnutrition of the mother is severe, and weight gain in pregnancy is minimal, then the quality and quantity and duration of breastfeeding can also be affected.

Consequently, the already vulnerable infant finds itself pushed, almost from birth, into the vicious cycle of malnutrition and infection. Low birth-weight and weight-faltering in early infancy therefore becomes a major cause of infant mortality and the sabotaging of health and growth. A WHO-aided study in India, for example, found that one third of low-birth-weight babies were moderately or severely malnourished by the age of six months and that by the age of one year, the proportion had risen to half. By contrast, among babies weighing 3.1 kilos or more at birth, only one in twelve was similarly malnourished at the age of six months and one in six at the age of one year. In other words, malnutrition in infants was three to four times more likely for low-birth-weight babies.

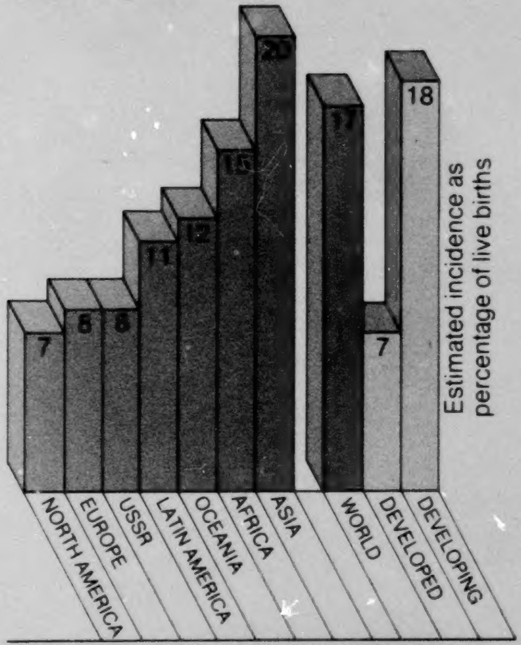
In view of such evidence, it is not surprising that approximately 4 million out of approximately 12 million infants who now die each year are low birth-weight babies. For they are virtually born into the vicious cycle of malnutrition and infection which claims the majority of those young lives. Coupled with the significant evidence of its negative effect on a child's social and intellectual development, this means that low birth-weight is also a major contributor to that other tragic cycle of malnutrition, ill-health, impaired mental and physical development, lower productivity, continued poverty, and perpetuated malnutrition and ill-health.

This cycle must be broken into for the sake of the development of both the child and the community. The ultimate solution to the problem is, of course, overall socio-economic development. But there are immediate actions which can reach the unreached *today* and significantly reduce the risks to life and health. Appropriate, simple technology is available for the effective application of recent scientific knowledge. And if those immediate actions can help to break into the self-perpetuating cycle of malnutrition and infection, poor growth and continued poverty, then they can also play an important role in supporting that long-term development itself. The quality of a population's health is a key factor to development itself. The future health of mankind therefore depends, to a great extent, on the nutritional status of mothers.

Preventing low birth-weight is one of the most cost-effective ways of breaking into that cycle, saving the lives of many millions of children, and protecting the healthy growth of many millions more. And there is now evidence that the incidence of low birth-weight can indeed be reduced – by the simple method of supplementing the diet of at-risk pregnant women.

As a general rule, a total supplement of 10,000 calories for a severely malnourished pregnant woman during the last three months can increase her baby's birth-weight by 50 grams. An average of 600 calories a day for those three months could lead to an increase in birth-weight of approximately 300 grams. This means that in a community where 20% of births are low birth-weight and 8% are lower than 2.2 kilos, such a supplement could be expected to reduce low birth-weights by about 60%. A more dramatic change in the survival and healthy growth chances of infants and children in the developing countries would be hard to imagine. And the cost, for so great a gain, is no more than a few dollars per woman at risk.

Fig. 2.9 Global incidence of low birth-weights



Note: Low birth-weight = infants weighing 2500 grammes or less at birth.

Source: WHO. World Health Statistics Quarterly. The Incidence of Low Birth-weight: A Critical Review of Available Information. Vol. 33 No. 3. Geneva 1980.

The impact and cost-effectiveness could be even greater if the proportion of low-birth-weight babies is high, if food supplements are targeted to severely malnourished women alone, and if such supplements are indeed consumed by the women and not shared with others or used instead of buying food.

In villages of Guatemala, for example, infant mortality rates have been reduced from 135 to 51 per 1,000 after a health care and food supplementation programme had been started. Among one group of mothers, the incidence of low birth-weight was reduced from 30% to only 4%. And when birth-weight was at least 2,750 grams and the child was breastfed, the neonatal survival rate approached 100%. It was not possible to isolate the separate contributions of food supplementation and health care.

The question of how to put this relatively new knowledge into practice remains the major problem. In general, food supplementation programmes have not been particularly successful so far – often failing to reach all needy and severely malnourished mothers and children at the grassroots levels. Many also tend to be expensive, to require sophisticated logistics to transport food supplies to remote places, and to foster a passive 'hand-out' mentality instead of helping to develop local self-reliance.

Alternative and more effective approaches have been developed. But they have not yet been widely replicated. Essential to their success are community involvement, health education, and the mobilisation of every possible resource and organisation within the community – health workers, religious leaders, traditional birth attendants, women's groups, mothers' associations, older school-children. Such programmes can develop systems of surveillance based on simple technologies like portable weighing-scales, tri-coloured arm-circumference measuring bands (an arm circumference of less than 22.5 centimetres is an indication of risk of low birth-weight) and weight-gain cards kept by the mother-to-be in her own home. Such surveillance can also be improved with the knowledge that the chances of low birth-weight rise, if the birth follows very closely after a previous birth, if there have been four or more previous pregnancies, if women have previously given birth to low-birth-weight babies, if weight gain is less than 1.5 kilos a month over the last three months, or if a woman is very pale and obviously anaemic.

Once all pregnant women at risk have been identified, the supplementary foods themselves should preferably be found cheaply and locally and be based as much as possible on local production in order to minimise dependence. And if such supplementary foods are to be actually eaten by the women who need them, then education about the importance of diet in pregnancy and lactation will be necessary not just for the women themselves but for the whole community. The distribution of iron and folic acid tablets can also help to counteract specific nutrient deficiencies. But the most important task is to help create a new recognition among families and communities that pregnancy and infancy are vital and vulnerable times and deserve priority in the allocation of the food which is available.

If food supplements for women at risk can be extended to the period of lactation, then the protection which breastfeeding affords can be extended further across the child's life. But between the age of four and six months, the child needs semi-solids and solid foods (though breastfeeding should also be continued for as long as possible). To avoid faltering growth, it is essential that parents know that this is the right age for weaning to begin. In some parts of India, only about 2% of infants in villages are receiving semi-solids even at the age of six to eight months. Most parents are willing to accept that weaning should begin earlier if they perceive the need for themselves on a growth chart which actually makes the child's nutritional progress – or lack of it – visible to the parents themselves.

Nutrition education – as well as food supply only for the families with at-risk women – can again play a vital role in protecting health and growth during the weaning months. The weaning food itself should be based on foods which are easily available and easy to make – preferably foods from the family pot including, wherever possible, peas, beans, green leafy vegetables, cereals, fruit, groundnuts, yoghurt and milk.

Finally, a special plea must be added on behalf of the young girls of the developing world who are so often neglected and ignored – receiving a smaller share of the food and performing a larger share of the work than the male members of their families. Such burdens can also reduce a teenage girl's chances of optimal growth. And many studies have now shown that low birth-weights are also strongly related to poor nutrition of the mother in her own childhood. That is why one of the main messages in my work with mothers in India has been, 'If you want a healthy grandchild, take care of your daughters now.'

III

IDEAS IN ACTION

The story of the present potential for a change in the health and well-being of millions of the world's children is not just the story of technical breakthroughs. It is also the story of a struggle to improve the human condition. In this chapter, three distinguished writers of the developing world record their own experiences in countries and regions where this change may now be beginning.

Being
from
Eduardo Galeano in Nicaragua

Chizuva
from
Charles Mungoshi in Zimbabwe

In Manggis
from
Anita Desai in Indonesia

Being

by Eduardo Galeano

Eduardo Galeano was born in Montevideo, Uruguay, in 1940. As a journalist he was editor of the weekly Marcha *and in 1973 he founded the cultural magazine* Crisis *in Buenos Aires, Argentina. He has written several books, three of which have also been published in English including the widely-acclaimed* Open Veins of Latin America. *His latest work is* Days and Nights of Love and War, *published in 1983 by Monthly Review Press. He is now working on a trilogy –* Memoria del Fuego *– the first volume of which has already been published and translated into many languages. Since 1977 he has been living in exile in Barcelona, Spain.*

Being *has been translated from Spanish by Judith Brister*

'Touch this hand.'

This hand that feels the womb and locates the head and straightens out the lopsided baby. This hand that transmits calm and strength to the mother, while her body unfolds, and then offers her cinnamon or lavender tea. This hand that gives a dab of honey to the new-born child so this will be its first taste of the world. This hand that buries the placenta, which is like a root freshly pulled out, which is covered with earth and returns to the earth.

This hand that gives birth. What could be a more wonderful occupation?

'The first child I delivered is old already. I've delivered thousands. And twins, three times. Never for money. If someone wanted to pay me with a chicken, I'd accept with pleasure, and that chicken would be like a whole cow for me. I've delivered quite a lot in the hills, alone, in the middle of the night. Burned the cord with a nail. In the old days, that's all there was. I was taught by one of my grandmothers, who told me, "look, granddaughter, I'm going to die. Learn so you'll help yourself and others." I come from the end of the earth. I won't be able to help out much longer, because of my age. But I'll teach others. It's an honour to. Until God takes my life. Until then.'

When Nicaraguans say 'the old days' they mean four years ago.

'There were no shots, no nothing.'

Green mountains flanking bullet-bitten walls: in the city of Estel, still scarred by the leprosy of war, midwives from different areas are restocking their UNICEF kits. The first time they were summoned, the local midwives were afraid to come. Midwifery was not permitted. You had to pay doctors who never showed up, trek to hospitals which didn't exist. In 1979, however, the revolution which had just overthrown the Somoza dictatorship did not summon midwives to put them in jail, but to train them and give them diplomas. Now they always come, some from the war front, from the alligator's mouth.

'I began with myself. I would take care of myself. I gave birth to seventeen babies that way. And then I had to deliver other babies, because in the Bramadero valley there's no one around to tie the cord. My knowledge was natural, but now I give shots and have iodine and mercurochrome. In the old days no-one paid any attention to you. And babies were born on the floor, any old way, and many died. We're changing. That's what we're doing. Changing. But we've been reduced to rubble and we're poor and now, war again. And I tell you this: we've put our hands on the plough and we're not going back. As Christ said. And don't ask me anything else because I'm very nervous. They've just killed a son. That's how nervous I am.'

This is a day of celebration. The midwives have come to Estel to celebrate something worthwhile. Last year twenty-five infants died, stricken down by tetanus. This year, not one. Midwives don't sever umbilical cords with machetes anymore, or burn them with *hot* grease, or tie them without sterilising them. And vaccinations have also been crucial: vaccinations given to pregnant women transmit the immunity to the child being formed, as if it were an organ in the mother's body.

This year, not one.

'We have defeated death,' says one government representative at the meeting. 'And a revolution is just that: defeating death.'

More contagious than The Plague

Health care has ceased to be charity in Nicaragua. The victims make themselves protagonists.

4

Eighty-seven thousand volunteers took part in the malaria eradication campaign: in three days they did five years' work. Health care is everyone's concern and mobilises all. During the vaccination campaigns, just as in the literacy campaign, the brigades go from house to house, reaching the most remote areas. In 1981, in Ciudad Sandino, a suburb of Managua, they sang while they vaccinated. When collective energy is released, solidarity is more contagious than the plague. A poor country, profoundly sick, is transfigured by moving beyond selfishness.

'Once,' Fernando tells me, 'I saw a chicken pecking away at a mirror. It was as if it were kissing its own image. A bit later, it fell asleep out of boredom.'

'They should tie a millstone around our necks'

A poor country, devastated by dictatorships, wars and earthquakes. A country under siege. But mass mobilisation multiplies the bread and the fish. And finally, to give but one example, it costs no more than US $20,000 to provide tetanus vaccinations to *every* Nicaraguan woman of reproductive age – and $20,000 is what the world spends on arms *in one second.*

Nicaragua has achieved, in four years, a spectacular decrease in infant mortality. There is a long way to go yet, but children occupy a central place in the process begun at the fall of the Somoza dictatorship. 'If this weren't so,' explains Tomás Borge, Sandinista government minister, 'it would be best for them to tie a millstone around our necks, like the Bible says, and toss us into the sea.'

Children used to die like flies. That was the way things were. Government statistics depended upon the imagination of functionaries. Diarrhoea, fevers and vomiting snuffed out many new lives and the official records ignored this most of the time. Shortly after the triumph of the revolution, doctors discovered that *all* the children in a poor neighbourhood in Managua had symptoms of tuberculosis, and in some rural villages, such as Raití, eight out of ten inhabitants had TB.

A revolution is a revelation. Nicaraguans are discovering their own country. How many people in Nicaragua have TB? This is still not known for certain. More are discovered the more the search goes on. The struggle against tuberculosis will be long and difficult in a country where milk, eggs and meat continue to be, for most of the population, items as extraterrestrial as flying saucers. But measles no longer kills anyone, polio has disappeared, and the incidence of malaria has been cut by a third.

Of every ten Nicaraguans who died, four were under a year old. Of these four, two died of stomach infections. Diarrhoea was the most criminal, the first cause of death in 1979. In 1982, it was the third. In 1983, it is in fourth place.

Fernando, the Poet Doctor

In early 1980, Fernando was sent to the town of Tortuguero, on the banks of the Kakarawala river, because measles was on the rampage.

The people there had never seen a doctor before.

Fernando set up a makeshift hospital, vaccinated and gave out medicine. The war against measles took two weeks, but then the rains forced him to remain there. It rained as if it would never stop.

Time passed and Fernando was still a prisoner of the rain. When his supplies gave out, he healed with herbs. Fernando fought inflammations with the milk of a certain tree bark and he used the acid of a leaf for toothaches. He treated coughs with a tea made of flowers. Chicken fat, melted over fire, soothed chest pains. For laryngitis he prescribed molasses. Annatto tree (achiote) powder is a good dye, but it also fights off infections. He used citron blossom butter as a balsam.

With the oral rehydration salts he had brought he saved more than one dying child. When the salts were gone, he concocted a home-made remedy, using boiled water, sugar and salt, in the proportions indicated by the UNICEF experts, and he taught the people to prepare and use it.

A doll to explain medicine

Nicaragua is the first country to use oral rehydration salts for diarrhoea on a *nation-wide* *basis*. There are 334 permanent oral rehydration units throughout the country and an infinite number of local centres which distribute the salts. Health workers carry salts sent by UNICEF in their knapsacks and they train others to prepare them. To explain the symptoms of gastro-enteritis they use a doll – a squash or marrow shell is turned into a human head. The shell has an opening on top and several little holes in it which are plugged up. The health workers fill it up with water and place a cloth over the top opening. Then they unplug the eye-holes and the squash cries. Through another hole it urinates and through another it has diarrhoea. As water escapes, the cloth sinks down the way a dehydrated child's fontanelle sinks, it cries without tears and urinates little or nothing.

Efficient propaganda campaigns explain that the children, like plants, die if they dry up. Tradition and some doctors once recommended that children with diarrhoea shouldn't eat. Now it is known that it is quite the opposite.

In the old days attempts were made to introduce oral rehydration therapy in Nicaragua. It was no use. Mothers travelled long distances to reach the few doctors and rare hospitals, and they felt cheated:

'What? I bring my baby this far, and he's dying on me, and you offer me this water? You won't even give me medicine? You're not even going to give him a shot? The trip has been a waste of time.'

A character called Uro

The rain pellets us in the cabin of a truck that careers towards the jungle. This is the gold-mine region, to the south of Bonanza. The jungle curves over the mountains and the truck follows it, over collapsed and teetering bridges, and we leave behind a few villages comprised of wooden houses on stilts. Using my hand as a visor I manage to see, through the curtain of rain, spectacular landscapes. This world seems the work of a god who on Sundays dabbles in primitive painting.

Heat with rain is winter. Heat without rain is summer. It rains a great deal, for months at a time, on the Atlantic coast. The rain brings life, life which blossoms forth violently all over, but it also multiplies diarrhoea and malaria. Swollen swamps become cultures for breeding flies and mosquitoes, and rains scoop up refuse and excrement, and rivers, contaminated by the gold-mining companies, overflow.

'How many children have you had?'

'Ten.'

'How many have died?'

'I lost four.'

The dialogue is repeated. The numbers change: twelve children, five dead; eight children, four dead. And so on.

Between houses that resemble ships we chat with a woman from the Wasminona Indian community. She has the body of a girl and eyes much older than she is. Three of her children, she tells me, have died of diarrhoea. Three others were saved by URO within a year. URO, a character quite popular throughout Nicaragua, whose full name is Oral Rehydration Unit, works in each of these jungle communities.

This is the war zone. The soldiers of the defeated Somoza dictatorship are not far off. The nurse who coordinates and supplies the various health centres, travelling through the jungle on foot or the back of a burro, has a shotgun slung over her shoulder. In the town of Zopilote, women as well as men have gone to the front. The women who remain behind share their breasts. They nurse their own child with one breast and the baby of a woman who is away with the other.

Maria, the Laundress

María has seen several children die from diarrhoea: colour without colour, dried up, skeletal, gasping like fish out of water.

She is in charge of a local URO in a working-class suburb of Managua. Four years ago people said to her,

'What can you know?'

Mothers would bring in their children with sunken fontanelles and she would give them oral rehydration salts instead of injections and she never rubbed their heads or pressed the roofs of their mouths with her finger.

As the person responsible for health care in her area, María the laundress is also responsible for seeing that neighbours who have not yet built latrines finally dig them, and she organizes puddle and garbage clean-ups and speaks with each mother whose children have not yet been vaccinated: with this woman who thinks her child is well enough protected by the power of God and with the other one who is sure the vaccination will inflame her child's knee or prove fatal.

María has learned pre-natal care and to identify the different stages of malnutrition. Through her hands pass the food sent by international agencies to improve the diet of pregnant women in this neighbourhood and from her mouth come words that also help: she explains that there is no better food than mothers' milk and she fights off the panic of new mothers who are afraid nursing will ruin their breasts and their men will leave them. María chases away the doubts of those who think that the first milk, yellowish and thin, is no good, or that the milk of a woman with a cold can upset her baby. In order to keep the milk flowing, she tells them you must eat well and break with the old custom of eating just cheese and corn for forty days after the delivery, to prevent your blood from becoming foetid.

I ask about the neighbourhood health brigade, which she directs.

'Do children take part?'

'Not very young children. They're already adults of about fourteen.'

María, the laundress, has never received a cent for any of this. She has soap-bleached hands, a husband nearly bankrupt as a result of an accident, and six children: '... the oldest I feel sorry for – I don't even have shoes for them...'

In her home candles are kept constantly lit under the pictures of Jesus Christ and Sandino.

María, the laundress, talks as if she were many people. And she is.

Denis, the Brigadista

It was a field of tulips of every shade and he walked or floated, feeling himself called. Suddenly, a man or a strange light came in front of him and lifted him up and carried him in his arms. Denis had never liked to be carried, but he felt comfortable and quite secure in these arms.

'I said, "Who are you?" He didn't answer. But it was a case, as you say, of trust at first sight. I wasn't afraid. I was pressed against that chest in the tulip field, asking and asking, and he kept quiet, quiet, until finally he said, "But don't you see?" Then I woke up and I had some wings here on my back.'

'Were you happy?'

'Worried, really. But then I touched them and they disappeared.'

'Didn't you like to wake up with wings?'

'It was worse another time when I woke up turned into a dinosaur.'

Denis is eleven. He lives in a Managua neighbourhood. With his fellow youth *brigadistas* he has gone from house to house in search of children who haven't been vaccinated, convincing certain stubborn or fearful parents that the polio vaccination is neither a poison nor a potion to turn children into communists. In the struggle against malaria, Denis and his companions collect and burn garbage, attack swamps, stagnant water and puddles, cut away weeds and plant almond trees, mangoes, and willows.

'There were so many mosquitoes here before that each time you clapped you killed five or six.'

Legacy

Saving children is a collective task here, made possible because people believe, for the first time, in what they are doing. They believe and they create: in unleashing their creative energy, the community discovers it can turn words into acts.

It is not easy. In spite of the international solidarity, there are not enough doctors and hospitals. In Managua, infants with signs of some abnormality are kept two to a crib; and in the child surgery wards, children who have just been operated upon are sent home after three days.

But the material difficulties, which abound and are compounded by the unremitting war, seem insignificant in the face of others: no magic wand can wave away the legacy of inefficiency and fatalism. For centuries this country has been taught to obey, not to think, to endure history, not to make it. All this was organised so everyone would be resigned to the life he or she led and accept misfortune and early death the way the winter rains and summer suns are accepted.

The lightning literacy campaign in 1980 demonstrated from the start that revolution is an enthusiasm more powerful than hardships, but living within the same country today, and fighting against one another, are the country that was and the country that will be.

The Evil Eye

Hunchbacked cows cross one another on the road. In the outskirts of the city play naked, pot-bellied children, with needle-like arms and legs. We are entering Juigalpa. These are the lands of central Nicaragua, where a poet sang to the milk rivers and curd rocks.

Until recently the only treatments for diarrhoea in this region were herb roots, and anise was used for coughs and chest pains. It is still believed that diarrhoea is not caused by hunger, filth and flies, but by the stare of a drunken man or a menstruating woman. The child can be saved if spit upon by the person who gave the evil eye.

A Little Beyond

Delegates from Juigalpa's local organisations meet, concerned. Things are not going well. It is necessary to launch a new campaign against diarrhoea among children.

There are several oral rehydration units in the region, but almost no local UROs. *Brigadistas* are scarce and must cope with sloppiness and tortoise-paced progress.

'They want everything handed to them.'

The volunteer *brigadistas* explain that home-made oral rehydration salts are prepared with a litre of boiled water, seven soft-drink capfuls of sugar and one of salt. But above all they explain, and demonstrate, that education and health care are not received, but are the work of all.

On the road to the plantation 'Los millones' we pass Villa Sandino, formerly Villa Somoza. We ask how much further.

'Over there, a little beyond the rise.'

The little turns out to be quite long. At last we come to 'Los millones', so named for the earnings of its owner, married into the family which for over forty years ruled the country with a dictatorship. The man sold his last ashtray and fled as soon as he felt the first puffs of the storm ahead.

Today the farm has a health centre, still rudimentary, and a dining hall for children, and the workers have latrines. But the latrines are full of flies and the children run around barefoot and their bellies show the unmistakable signs of parasites. Drugs are no use if the next day parasites re-enter the body through the bottom of the feet.

Jesus, the Bricklayer

Scrawny barking dogs, dust and sun, and among the jungle-thick trees, some houses thrown together with four planks, three sheets of tin, two rocks. On the road to the market, women carry fruit on their heads. Men are sprawled under the shade of trees, always on Sunday. There are no *brigadistas* in this town to teach that a child's fontanelle sinks as a result of dehydration and not because of a sudden jump or a curse, and that mothers' milk, which may not seem to fill, makes children grow up strong. But Jesus, the bricklayer, and other volunteers have built the schoolhouse, which was just a papaya tree before, and cleaned out the gullies and vaccinated everyone.

Jesus, the bricklayer, skinny, all jaw, earns his living raising walls. He also grows tomatoes and beans and picks up the odd job. I ask him how many children he has. Four, he tells me, from his marriage, and one outside the marriage, who died.

'Last night.'

His name was Merlin, and he was three months old.

'His heart petered out.'

Melania, the Market Vendor

In Managua's Mercado Oriental, Melania sells caramels and honey-coated popped corn. She is nursing her new-born baby. This is her third. One died and the other is alive with a handicap – head bowed, eyes glazed, arms jerking.

What does Melania eat every day? Until her baby is forty days old, she eats just corn tortillas and milk curds. No beans, fruit, eggs. 'The doctor's orders.' What doctor?

She answers with a laugh. 'My grandmother.'

The Powers of the Breast

Malnutrition, hunger's masked sister, still castigates seven out of ten children in Nicaragua. And not just as a result of material poverty. This is also due to taboos and to advertising which for years has persuaded people to prefer canned milk over maternal milk and to purchase soft drinks instead of fruit juices or cow's milk.

The doctors explain. By means of skits and comic books, they teach that after the third, fourth and fifth months babies need something besides their mothers' milk. But many people think that beans make babies' blood dirty and lemon juice curdles it, that eggs cause stomachaches and that vegetables are grass and grass is for cows.

Orlando tells me that in his region they think milk causes diarrhoea and produces amoebas and Lilian tells me about the pregnant woman who refused to drink milk for fear her child would be born covered with butter. Mauricio has seen thousands of women in the hospital arrive with soft-drink bottles containing red-dyed water because they thought it contained blood or they believed the advertising that promised vitamins.

A government decree has put a complete stop to the heavy advertising for powdered milk, which convinced women they should mistrust their own milk, and an extensive campaign explains, through all the media, that mothers' milk transmits immunities, that it can last an entire day without refrigeration, and that it is the best food for the newborn, no matter what husbands or mother-in-laws have to say. In addition, and this is more difficult to explain, nursing connects the mother to her baby and gives the child mysterious vitamins which would never show up in a laboratory test. In an old hospital in Managua, women sometimes abandoned their babies after birth. That occurred until the cribs were connected to the mothers' beds. From then on, no mother has fled from the baby who sleeps beside her, pressing against her breast.

A theatre to explain medicine

On a road of white-crested volcanoes we reach Jinotepe. At a nurses meeting I ask to be shown their persuasion techniques. They proceed to improvise skits. Each of the nurses becomes, for a short while, the star of a 'put on, take off' theatre. Two typical situations: the dehydrated child whose mother mistrusts rehydration salts and the pregnant woman who comes to have her 'stomach looked at' for the first time. Mime and words, humour and love.

In this country, every nurse or auxiliary nurse is a walking health clinic and a strolling comedienne.

Nora, the Seamstress

She teaches by cooking.

Nora is a seamstress, old-clothes surgeon, and this is her livelihood. In addition, as a member of the women's association, she teaches by cooking. In Jinotepe and the surrounding area, Nora disseminates dishes that are new or little known, and which at the same time are joys to the mouth and sources of good health. Nora visits neighbourhood and town kitchens, demonstrating. Every neighbour brings some of the ingredients needed for the recipe of the day.

'Today, fiesta salad.'

You don't eat to deceive hunger, but to enjoy and to multiply life. If you lack certain seasonings, you can use leaves from the lemon trees in the yard and if you can't find better potatoes, you have the chance to show off sweet potatoes, something of a novelty in Nicaragua.

To defeat malnutrition, which kills or mutilates so many children, it is necessary to include vegetables and fruits in traditional dishes, as well as the fish which are so plentiful in this country of seas and lakes. Through the women's association the government distributes lettuce, cabbage, tomato, radish, cucumber and carrot seeds, so they may be planted in yards, in the ground or in pots, family gardens that cushion the effects of shortages and speculation. And they also distribute squash seeds, and the pregnant woman afraid to look at the squash flower, because of the belief that the plant will be ruined if her eyes touch it, is told,

'Look.'

Nora, the seamstress, teaches people how to cook fish and meat with such art that no mouth can resist and she explains that onions are the arch-enemies of amoebas, parasites and germs. Of late, Nora has been loaded down with soya beans. With the soya beans she brings good news: one half-kilo of the exotic bean, which is sold at a bargain price, is the equivalent of twenty-five eggs or five litres of cow's milk. The beans are washed and soaked overnight and then hands and heat transform them into endless delicacies. Soya bean milk makes refreshing drinks and ice creams and soya bean cheese accepts all marriages and is called 'Here I wait for you' when it marries cabbage and egg white. From soya bean dough emerge soups, cakes, hash, stews, patties and candies. Sauces, breads and candy paste are born of the toasted bean. The whole soya bean goes crazy over the native beans and green soya beans pursue rice. Soya germ...

'It tastes like new corn and after eating just a little of it you feel you've come from an enormous banquet.'

Cándida, the Midwife

Who in the town of Santo Tomás has not been brought to the world by the hand of Cándida?

This journey starts with the midwives of Estel and ends with the midwife of Santo Tomás, while Nicaragua is born more and dies less.

'The main things are the tone of voice and the hand,' she tells me.

And when we talk about the placenta, which midwives in Nicaragua always bury, she says no, it is not because it is dead that it is buried. The placenta remains alive and must be properly buried, in a dry spot exposed to bright sunlight. If this is not done, the mother who has just given birth will have a great deal of pain in her uterus. The placenta has to be buried properly so it will turn into dirt, just as we will, Cándida explains to me, because the placenta is a living part of the mother. And if things are done as they should be, the other living part of the mother grows on top of the earth and rises up on two legs and becomes a person and starts being.

Chizuva

by Charles Mungoshi

Charles Mungoshi was born the first of eight children in Manyene Communal Land near Chivhu, Zimbabwe. Most of his childhood was spent on his father's smallholding. He began writing whilst at secondary school and published several short stories in local magazines. He has since published four novels, plus collections of poems, short stories and plays, in Shona and English. His collection of short stories The Coming of the Dry Season *was banned by the pre-independence government of Zimbabwe.*

Charles Mungoshi's work has won several literary awards and has been translated into many languages. He is married with two sons and is presently working as a Literary Editor with the Zimbabwe Publishing House.

Chizuva winces at the squeaking sound that the door to her kitchen-living room makes as she opens it. She knew that it would squeak, no matter how cautiously she tried to open it. The wincing is a reflex action, the result of years of a belief that has become part of her: one shouldn't make unnecessary noises at night. Yet she could have sworn that it was the fourth or fifth cockcrow that roused her from her light sleep. She had pulled herself out of the blankets crabwise, careful not to disturb her four-year-old daughter, and made sure she was covered and warm before she left their reed-mat bed. She had crossed over to the other side of the fireplace to check on the two boys, aged ten and twelve. The older one had all the blankets bunched up and well-tucked in round himself while the younger one lay half on the cold floor, almost at right angles – with head away from his big brother. Chizuva straightened him up back onto the mat, pulled the blankets from under the older boy and spread them out equally over both of them and then went to the door.

Now, standing in the doorway, she wonders whether it was really the cock she had heard. She turns her head, first to the left, then to the right, trying to catch that familiar twit-twit-twit that would tell her it is time to start the new day. Not a sound. She ignores the now subdued, more familiar human sound of singing and thudding drums that has been like a pillow to her subconscious all through the night. It is a sound that smells of human warmth and security and it doesn't in any way disturb her sleep. If anything, it is more like a lullaby, a benevolent spirit that flies side by side with her dreams, guiding and guarding her and the children while they sleep. With it, one knows one is home and safe.

It couldn't have been the drums that woke her up. Remaining just inside the doorway, she bends far forward to look outside. The night is very still, everything so sharp and clear in the bright moonlight that she could see a needle twenty yards away. To her right she can see across the barbed wire fence into her neighbours' yard, a stone's-throw away.

The light of the moon lends a weird ghostly diffusiveness to the buildings and their corrugated iron roofs look like distant pools of water when sunlight glances off them through a mist at dawn. Despite the illusory mistiness, the edges of the buildings look sharper than they would in broad daylight.

Points of light glint off familiar homestead objects: the pounding mortar in the middle of the yard; the two empty oil drums half-hidden in the shadow of the granary; the dark triangular shape of the bicycle with the brilliant silver handles leaning against the near wall of the bedroom; the square box frame of the cart with its diesel boom resting on the Y-shaped peg at the far side of the yard; the dark coiled-snake apparitions that must be the discarded motorcar tyres abandoned almost all over the yard by playing children. All this she takes in at a glance. All this, she knows.

No. Her eyes are not for the familiar everydayness of things. They are for the blobs of shadow sharply etched on the ground below and round these objects. She trains her eyes on the large area of darkness beyond the cart, the toolshed, where, she knows, the ploughs, cultivators, harrows and more oil drums are. She doesn't quite let the thought take form in her mind, but it is there, like her silent breathing: these are the places where danger lurks. She calls it 'danger' but it would be more precise to say 'witches'.

Chizuva's home is the last in a long line of other homes in this village. Nine years of living here – at first, alone, almost a stranger, with her little ten year-old sister for company, and now with her almost grown-up children – have almost erased the irrational but genuine fear of feeling too far away from other people. In the first year, whenever she opened her door at night, the first thing that would come into her mind was: If I scream, no one will hear me. Then, she wouldn't dare stand in her doorway as long as she does now, especially with such a bright moon in the sky. Now, her thoughts are more like a challenge: come nearer if you dare – despite the distant palpitation in her heart. The confidence had been slowly and painfully building up in her all through these nine years, as, with each passing illness of each of her surviving children, she has watched them pick up health again and continue to grow up. Now, fear for her own person has been lessened – or rather – has been changed into that something which makes a cow dare a lion to take its young, or a mother hen spread its wings over her chicks to face the claws of a hare-killing eagle with her blunt beak.

Really, some of this confidence comes from the people she now knows in this village to which she and her husband came as complete strangers with nothing in their hands except a small two year-old child who was at death's door with a swollen stomach and reed-thin limbs and a head swollen to the size of a football. And one death behind them. They still have nothing, compared with most of the people in Mwanza's village. But what are riches if you have so many friends to laugh and sing and work with during the day and at night you have three pairs of ears to leave something of what you have seen and endured to?

Now she lets her eyes sweep under the shadow cast by the big *muonde* tree to the east of the neighbours' home, on, through the dancing shadows of the *mukute* bush, on through the trees the other side of the valley to catch glimpses of other patches of ghostly light and misty pools of placid water – that is Mwanza Shopping Centre, on and up to the furry-edged jagged line of the mountain range behind which lies Murewa. It isn't really far, physically, but with the time and what she has seen, it could be farther than the moon. Her parents' home.

She suddenly realises her ears and nostrils are half-frozen. It is one of those windless high-skied moonlit July nights when the stars themselves seem to be weeping frosty tears.

It is really the middle of the night, she tells herself as she softly closes the squeaky door, remembering good-humouredly, thinking of another time when the moon had again fooled her.

They had walked over ten miles with her aunt – who was almost her age – before they realised it wasn't even yet first cockcrows. Maybe it was an omen: the home you are so eager to go and build won't be built so fast? She had become pregnant while still in her parents' home and so she had had to leave quickly before they discovered it. Zakeo, her husband, hadn't yet made himself 'known' to her parents and if she had stayed on in that state, their 'backs would have been broken' according to traditional custom. She now finds it amusing that her parents, who were strict Apostolic Faith Church people with their sole trust in the God of the Bible, should have believed in that *one* of many 'heathen practices' – as they called most traditional customs.

She makes another check on the two boys before she goes back to lie down. She carefully lifts up the blankets on her side – just enough for her to slip in between them and the old bag she uses as a sheet or cushion so that they don't wake up with 'zebra stripes' from the hard thin slats of the reed mat.

She stretches out her hand to check whether the 'little one' – whose warmth she can feel against her breast – is comfortable and well-covered. She is careful not to touch any naked part of the child's body with her cold fingers. Satisfied, she settles back comfortably, stretches out to her fullest length and lets out a big sigh. She considers herself lucky – and she is proud of it – that once they are past the ages of two or three, her children hardly wet their beds. Protectively she scolds herself for this thought.

Lying on her back, her head on the pillow stuffed with her old dresses and her children's now useless clothes, Chizuva's eyes command a full view of the door. She sees how wide the chinks between the boards of the door really are. Well, what would you expect a door made by a drunkard to look like? What would you expect a door to do if it were the grave of whorled, twisted and crooked blue soap-box boards? With Zakeo away in the city all the year except for twenty-one days around Christmas and New Year, what do you expect a desperate wife who wants to keep the bad winds away from her children to do?

But she is not bitter. She has learned to distance herself from her sorrows and miseries in a way that leaves her with even more energy to face what needs to be done in the home. Because, she has learned, viewed from a distance, even the most sorrowful memories glow with a mysterious light of their own, and then you find yourself singing. And once you start singing, half the work is done...

It is surprising how one doesn't notice the slits in the door during the day. You can hardly see through them at that time. But here they are now, wide enough to let in a whole human being! The shadow of a blade of grass blown across them by the wind can suddenly be magnified to the size of a hyena! Paint the door to close them up? She wonders, worried, but not wanting to admit it. She could easily do that herself but where would she get the money for the paint? She could brew a pot of beer and ask one of the casual work people who are floating about the villages in swarms these days, but once they are drunk, you can think of the job as having been done, thank them, give them food, and disappear. They will wait and wait and wait for you, thinking there is still more beer, until their frost-bitten fingers can't hold the newspaper to roll cigarettes any more, and then t[illegible]ill go away, cursing you, and you will come back to take the empty beer pots back into the house through a squeaking door that has slits that could let in a full-blown grandmother owl...

It is a long time since she last heard the sounds of those two ill-omen creatures: the hyena and the owl.

And the snake.

And the *mbiti*.

And *chidembo*.

How does the song go? The old song they used to sing about waking up at dawn and meeting a witch riding a white – more than white – hyena, and the owl on her head is the torch, and the long – more than long – snake is the whip? How does that song go again?

They used to sing it when they were still girls, safe in their parents' homes in moonlight bright as this that is here tonight...

Chizuva convulses in her sleep. Reflexively, instinctively, her arm jumps across and gropes all over the 'little one'. Having discovered that she is still there, she raises her head a little off the pillow to look across the fireplace at the boys. All she can see is a heap of blankets. She doesn't – not yet – panic. She slowly lays down her head. Beneath, almost under her, is the booming drums and singing up in the village at Mai Ngwarai's. But above it way, way above it, are the three separate nostril-whistles of her sleeping children... She knows they are still there. But she just has to make sure...

She knows they are there. She knows each of their little nostril-whistles by name. It is the last thing she hears every night when, after putting out the smoky oil lamp, she sinks down to coax rest from her ancestors. And it is the first thing she listens to before she rises from her bed at the first twittering of birds. Their snoring and little sighs and turns and night-talks and chew-chewings and regular breathing is the pleasant little waterfall sound that fills the background of her sleep with that subtle hard-to-name sense of warmth, security and achievement that gives meaning to her dreams of promises of better things to come...

She had nearly hanged herself when her first child died. They were both young then, and they didn't know what it was. They had quarrelled over how the baby should be treated for any illness. She had been given 'holy water' by her parents. That was the Apostolic Faith cure-all medicine. As tradition and custom demanded she had been taken back to her parents' home 'for safe delivery' and for the ante-natal medicines that only the mother of the woman who is going to have the baby knows how to give. She had been given 'holy water'. Roots and leaves and the invocation of dead ancestors' spirits were 'ways of darkness', her parents had said.

But when she went into labour, her parents had had to call in one of these 'devil worshippers', the only old woman in their little community who had been credited with bringing babies safely across. Chizuva had been in too much pain to ask them why the sudden change. For a whole week the child hadn't been allowed to leave the hut she saw life in. Her umbilical cord was buried by the old woman – *vanyamukuta*, the midwife – in a hole she dug on the floor behind the door, just a foot away from the grinding stone.

When the last bit of the umbilical cord dropped off, the hut was smeared with cow dung (to make it clean), and the child had then been allowed to see the sun.

Some days later, her husband's aunts and sisters came to see 'their daughter'. They brought with them maize flour, *rukweza* flour, *mhunga* flour, two chickens, and no money.

She can't remember now but her own brothers' wives (it must have been) 'returned the plate' some weeks later. This was the big day. She was finally going to live with Zakeo as husband and wife. The earlier ceremony – which had been the marriage – with almost the same visits and exchange of gifts – was counted as nothing beside this one: *she is fertile...*

But the child had died a few weeks later. She just saw the eyes and that its navel had been pulled far into its belly as if there were invisible forces pulling it – and she couldn't bear to look at her baby any more...

When the child died they all looked at her: her husband's parents, his sisters, his aunts – all his relatives looked at her. She couldn't look back at them.

There was talk of returning her to her parents ... there was talk at the place where the whole village went to fetch water ... there was talk at the bathing place on the river ... there was talk in the bush when she accompanied her husband's sisters to fetch firewood ... there was talk among the old women who sat against the walls of their huts soaking in the morning sun ... and there was a cold, calculated courtesy and kindness that was the worst of all to bear from her husband's mother ... and a glowering silence from her husband's father ... and Zakeo's face became old in one week ... silence grew on his mouth like a strange poisonous mushroom.

The word came out: *she is a witch.*

She had almost hanged herself. And now, lying on her back in her own home, she can hardly suppress the urge to laugh: a dirty razor-blade!

She doesn't want to laugh because the answer is so simple. She wants to cry because a human life can't be – can never be – so simple! A dirty razor-blade, and that's all?

But it was Mrs. Ngwarai who had later told her this, after she had come to live here. In her simple, self-effacing manner, in a voice that seems afraid of itself, she had whispered to her, 'Child, that old lady who delivered your baby must have used a dirty razor to cut the umbilical cord.'

And today Mrs. Ngwarai is her best friend and adviser, yet she still can't believe it!

At least she can understand how her elder sister's child died. Their mother told them clearly: there is no witchcraft in the death of your child, daughter of my loins, you were simply careless. How can you go to sleep – real deep sleep – just after you have packed your whole nipple – the whole breast – into your child's mouth? They are little, they know nothing, they can't say, 'mother, you are hurting me!' They wait for you to – they don't even know they are waiting for you – to put the nipple gently into their mouths and then, when they are snoring on it just as gently remove it. To them, mother is the breast. You think what we see on the buses is the way? A baby cries – we are older than you, children, we *see* – a baby cries, and you see the mother unloading her, then searching and searching among bottles of Fanta, wrapped-up other things – a bun rolls onto the floor here, a guava rolls under the next seat there – looking for what? And you see her producing out of the bag: a bottle of cold milk! My children, we are old, but we see. What does the mother do? She has been groping all over under the floor of the rolling and lurching bus for the last guava: she has touched grease, she has touched the saliva of someone who has been spitting all over; she has touched almost everything that has been thrown onto the floor of your bus to town – Harare, *musha wakachena*. And what does she do? Wipes the cold nipple of that cold milk bottle with the thick of her palm and shoves it into the crying baby's mouth!

'Tell me, my daughters, how does that cold milk help the baby when everyone on the bus can see that the mother's breasts are filled to bursting point with milk! Ashamed to bring out your breast and feed your own child? What do they know? They are harmless creatures who only want to be fed. They need to feel a mother's warmth against their face, not a cold milk bottle!

'... And you go to sleep, my daughter! Don't you know that you will roll over in your sleep and push the breast with its unfed milk into the child's face? How do you think it will breathe? Grow up, my child.'

In one stroke, Chizuva realises her mother had made her aware of another very simple cause for the deaths of little babies. The way her mother had explained it to her, despite her seemingly roundabout way of telling it, made Chizuva feel that she had always known this. She could have sworn that she knew it all along. But this other new knowledge – a dirty razor-blade, really!

She wouldn't have believed it if it hadn't been Mrs. Ngwarai who had explained it to her. Mrs. Ngwarai was almost her own mother's age. You didn't have to ask her for reasons for most of the things she told you. You simply believed her...

At last, the sound she had been waiting for: twit, tweeit, twit – twit! Without a second thought, Chizuva is up. Once again she makes sure that all the children are well-covered before she begins her daily household chores.

The first thing she does – remembered from childhood in her mother's home – is to to clear the fireplace of last night's ashes. The fireplace is a depression in the centre of the kitchen, with an earthen windbreak on the side facing the door.

She scoops the ashes out with a handleless hoe and piles them onto a flat sheet of corrugated iron. When she opens the door to go and throw the ashes onto the ash-heap some twenty yards away at the edge of the yard, light from the day-tinted horizon falls into the house. She can detect some movements across the fence in the neighbours' yard. There is the sound of a bus engine starting across the valley at the shopping centre. There are no human voices as yet, even the drumming and singing has stopped, but she knows that the world is safe now. A new day has begun.

In the first days of their marriage, she despaired at the number of things to be done in her home before the sun went down. That was because she was just starting her new life as 'mother of a home' and she didn't have anyone to help her. She had been brought up in a big family where all the six girls shared the 'women's work' and the eight boys looked after the manly work, milking the cows, digging wells or manure from the cattle pens, building the huts, ploughing the fields, mending broken fences and so on. She hadn't quite believed that one day she would find herself doing both the women's and men's work all by herself.

Now, she realises, it had been a necessary period of initiation. She hadn't realised it then, but she knew it now, that all the people in her husband's village had been watching her. Behind her back, they had nodded their heads: *chikara chomukadzi*, a real lion of a woman. She had refused help from young men of the village who had wanted to give her a hand when they found her chopping wood for the fireplace. They only wanted to help a woman, she knew, but she also knew of wagging tongues and bushes that have eyes. She was still a stranger among her husband's people then.

But now she also realises that she had made too much of her being a stranger. The truth is that she would have been glad to have someone to talk to. But, foolishly, she had relied on herself too much. She had found herself closing in, afraid to open up. And then the death of her child had further driven her inward. They said things that weren't true, she knew, but now she could also admit that she had felt just a little bit superior to her husband's people. She had been brought up in the ways of the Church, they hadn't. Now she realises she had been a little afraid of mixing with people who didn't understand. That's why she had felt superior to them. Self-defence. There is no such thing as a superior human being. It is probably loneliness. Like Mrs. Gwizo, the nutrition woman. She wants to make everyone feel that she is educated, she knows much more than they do. Why ever did the people choose her? Maybe her book-learning? It is people like Mrs. Gwizo who make it very difficult for other people to learn whatever they have to give, Chizuva tells herself. Thank God there were fewer people of Mrs. Gwizo's type. Not having gone to school, Chizuva resents being reminded of that fact. It wasn't really her fault. Her father's faith claimed that school was exposing children to sinful ways. In her unguarded moments, Chizuva would find herself hating her parents for this. Especially when she felt exposed to other women's laughter. Like that time at the clinic, for example. The nurse asked her to read the figures on Chipo's card and then compare it with what was shown on the scale...

If it hadn't been for Mrs. Mutiro who had just dropped in to collect her medicines, there would have been a fight...

Thank God there were people like Mrs. Mutiro and Mrs. Ngwarai, people who really want to help other people... Mrs. Mutiro and Mrs. Ngwarai ... whenever Chizuva thinks of those two old women, she feels guilty of neglecting or forgetting them. When she and her husband came to live here, after the death of their first child, they were among the first people who had received her with open arms. It had been a difficult time for her. She was still in the process of asking herself whether life was worth living or not. She had just weaned Tatenda, her eldest child. She had been advised by some people that the child's illness had been caused by her being pregnant. She had been frightened. She wasn't sure whether she was pregnant or not but she knew that if she was, then the child would definitely die. She wouldn't leave her hut all day. She wouldn't talk to anyone.

Then Mrs. Mutiro and Mrs. Ngwarai paid her a visit. They talked about almost everything – where she came from, what her totem was, how many they were in their family, how long they had been married – almost everything – except the illness of the child.

Then the following day, the two women had brought a man with them. (She was later to know him as Mr. Mukarati, the health assistant in the area.) Mr. Mukarati had told her to take the child to the hospital. It was far. Even if it hadn't been far, Chizuva didn't quite believe the hospital would help the child. What the child needed, she felt, was prayers and holy water. But then her parents were far away and she knew no one who belonged to their Church here. Finally, she accepted.

The child was saved.

Up to now she doesn't quite believe whether it was the medicine or God who did it but there is the child, still alive...

At that time Mrs. Mutiro and Mrs. Ngwarai hadn't become what they are today, health workers, but both of them belonged to the local Mothers' Union – a group of women who got together on Thursdays to pray at the local church.

After this, Chizuva changed her mind about dying. One day Mrs. Ngwarai said to her, 'Child, whenever you do a thing for the people, know in your heart that you also do it for God.' Chizuva had asked her how she could believe in God and yet at the same time 'brew a pot of beer for the ancestors'.

It had been difficult for her, and even now it is still difficult, to explain to herself how these things work, but she all the same accepted – and still accepts – Mrs. Ngwarai and Mrs. Mutiro's advice, without question, on most things concerning her children's health. There are days when she dreams that her father is accusing her of treading the 'heathen path', but she has learned to simply point her children out to him in the dream, and he disappears... As she empties the ashes into the ash pit, she notices that it is almost full. She makes a mental note to ask the people to come and help her dig a new rubbish pit. Then she decides that a rubbish pit is really a little thing to bother people with, she will probably dig it on her own, or ask her husband to send some money to – but then he would laugh at her. Money to pay someone to dig a useless hole in the ground? She doesn't quite blame him but then he has a nasty little habit of wanting her to 'tell me exactly' what the money is for. And a new rubbish pit isn't exactly the thing one would need money for, is it? Only that she will feel very embarrassed when Mrs. Mutiro comes round on her little bicycle with her bag and finds the pit overflowing with rubbish...

This is one of the things that used to bother her at the beginning of this whole thing about clean homes: it still bothers her and sometimes she finds herself saying to Mrs. Mutiro 'your rubbish pit', or 'your lavatory', when talking about these facilities in her own home. What she means is that she cannot quite see what a rubbish pit is for. She cannot quite explain satisfactorily to herself that it prevents dirt or diseases in her house. She knows Mrs. Mutiro, Mrs. Ngwarai, Mr. Mukarati and all the other health people are trying hard to explain what a rubbish pit means to her, but she just doesn't understand it. She feels sad that she doesn't understand it. She believes in everything that those kind-hearted women tell her and she doesn't want to disappoint them in any way but she wants to *feel*, in her heart, the need for a rubbish pit.

In her mother's home, girls were taught to wake up very early and sweep the yard; or to get rid of any weeds that might have started growing up in the yard at the beginning of the rainy season; or cut down any tall grass beyond the yard. You swept the yard and got rid of any rubbish so that 'if you dropped something – a coin, say – you could easily see it'. You cut the grass beyond the yard shorter so that 'snakes would be ashamed to enter the yard'. It was simple enough. You saw the reason, you did it. Soon enough, this grew into you in such a way that it could never be removed. Whenever you went on a visit, the first thing you did in the morning was to sweep out the yard, or if there were any weeds, to get rid of them. The thing was to be convinced of the necessity of doing anything you were told to do. Chizuva feels sad that there are many things she is told by people she trusts and she just can't remember them. There wouldn't be any need to want to remember them if they were as urgent as hunger, say, or an illness. Still, she manages now to remember some things she is told because they are all being taught to sing about them...

Thinking about the songs amuses her a bit. There wasn't anything like this before the war for independence. Now, every meeting opens with slogans:

Pamberi noutsanana!
Forward with health!
Down with dirt!
Down with disease!
Down with an unclean home!
And the songs!
Mr. Mosquito
who are you
going to bite?

Mr. Fly
whose food
are you going
to spit on?

All the rubbish
is in the pit.
My house is
spotlessly clean!
Down with Mr. Mosquito!
Down!
Down with Mr. Fly!
Down!

All the war tunes have now been given new words. It sounds like a real war too! War against dirt. War against disease. War against laziness.

If only she could remember it all. If only it didn't just end with the fun of singing it and she could bring it all back from the Women's Clubs, the Health meetings, the Parents' Day meetings, the Agricultural meetings, the District meetings – if she could bring it all back home, maybe she would learn to *feel* it, to make it take root in her heart so that she would never forget it...

She leans the corrugated-iron sheet she uses as an ash-carrier against the wall of the hut and grabs an armful of logs and some tinder to kindle the fire. When the fire catches and is cleanly blazing away, she takes a smoke-blackened empty gallon tin, fills it with water from a bigger five-gallon drum she keeps filled up to the brim on the *rukuva* or earthen platform against the western wall of the kitchen. Now, if she could only understand rubbish pits the way she understands water: you don't go to bed in a house without water in your calabash or *chirongo*. What will you do if visitors come in during the night and you want to cook them something to eat? What if one of the children became ill during the night and you want to cook some porridge for him? And if you became thirsty at second cockcrow and it's raining buckets outside?... If only she had gone to school she would understand most of these things. Still ... the songs help...

After putting the tin of water on the fire, she goes out to sweep the yard. She is really proud of her yard. It is small, with only three buildings in it: the round kitchen, the four-walled 'big house' or bedroom and the *hozi* or granary that is built on four boulders so that its base is eighteen or so inches off the ground. This is to prevent the termites from getting at the grain.

All three buildings have two-course walls of fire-burnt red bricks. In that granary are three partitions: one for groundnuts, one for monkey nuts or beans or *nyemba* – depending on what is in abundance in that particular year. The last *dura* is almost full to the brim with maize grain.

It has been a very bad year and she has heard that in other districts of the country – Gutu, Bikita and the Bulawayo area – they had hardly a mouthful of rain. We were lucky here, she thinks, but also remembering that even here there are some other people who hardly got a bucket of anything. Lazy, she almost says but then remembers that what she got was through working *majangano* with the other villagers.

It is an old idea really, *majangano*, she remembers as she thinks of how it is being used now in Goromonzi Kubatana District. And it helps. With all that she must do in the home – digging latrines, wells, making bricks – what could she have done alone without working together with the other villagers? Some people have money and they can easily pay other people to do whatever they want for them. What of us who have husbands who are getting just enough to buy school uniforms for the children?

Thinking of her husband, she wishes he would just leave his ill-paid job in Harare and come home. If it is money he is really after, he could make quite a lot here at home. He could get together with some other people, grow vegetables or keep pigs or ... there are lots of things that she feels he could do but then he would resent this idea coming from her...

Just like men, she thinks with some bitterness. All the men she has known, the same. Starting with her father who wouldn't send them to school because the 'holy book' was against it. Deep down in her heart, she feels grateful to her husband for not finally taking the side of his parents and sisters when their first child died. Come to think of it, she feels that he had been more than kind to her. Of course, other women, especially those educated ones of today, might say rubbish, but she really felt grateful to her husband. And then when things looked really bleak for them, he moved his home to Goromonzi, which was as clear a statement that he had nothing to do with his own people any more, as if he had said it loudly with his own mouth. She feels grateful to him.

All the same, she wishes he would come home to live. She feels time is running out for him. He is dreaming of becoming rich one day and then he will come home. But how can you become rich working for someone? You are slowly growing old and the day you come home is the day you are going to drop dead.

Her husband need not worry about what they are going to eat. The grain in that *hozi* can feed all their children for two consecutive years at two meals a day. She would only need money to buy things like vegetables, meat and the other things she couldn't grow or rear on her own.

I must see the agricultural demonstrator about the vegetable garden. She had just started digging holes for her fence poles when the demonstrator passed by the place and told her that it was too near running water, too close to the stream where most people water their cattle. She knew that no-one was allowed to grow their vegetable gardens near streams but then she had thought it wouldn't really matter – it was just one small garden and she didn't think the soil from it would completely silt up the whole stream...

Anyway, she should see him so that he can show her where to put the garden and when her turn comes for the people to come and work at her home, they will start digging the holes for the fence poles.

Maybe they just might even finish the whole job in one day. It is only a small garden – just for her children and herself. Some people were really making money from the vegetables they grew in their gardens but she doesn't think it will be that big that she can have any extra to sell ...

Most people would rather starve their children so that they can sell everything they grow.

'Money is nothing,' Mrs. Ngwarai had told them that time they were at the feeding centre. 'Look at your children now. We are giving them exactly the same food that most of you grow in your own homes, but what do you do with it? You would rather sell it and let your children starve! I wish that the government would pass a law that says anyone who sells any food that they should give to their children must be put in jail!'

All the women there had laughed. But it was an uneasy laugh because, now, after just a little over two weeks attending the feeding centre for the malnourished children, they could easily see that a lot of colour had returned to their children's faces. And most of the food they were giving them – although it came from the government – was mostly in their own fields and homes. 'If you think hard, women, you will find that this money which you so desperately need to amass really ends up by buying what you want to call "European food" – tea, sugar, bread – which is really of less nutritious value than the food you have sold in the first place.'

Some of the women might not have understood what she meant but you could see that their eyes glittered with tears as they looked at their once-almost-dying children. It was this kind of concrete proof, something that you could almost touch, that made most of them realise that what the government and health workers were doing was really for people's own good.

As a result, it was mostly the women (who really knew the pains of bringing a child into the world – and maybe of watching it as it was slowly and painfully separated from you) who responded readily to any schemes that the health people brought to them.

Some of it was hard work – like having to boil your drinking water every day. It might be necessary, as they said, just as keeping the house clean and free of flies was necessary, but it is just too much work especially after you have spent the whole day working like a donkey in the fields or helping to make someone's bricks.

What Chizuva does is boil the water every three days. She knows it's wrong but at least she is trying. After all, their parents and their grandparents drank it straight from the river! Chizuva often wonders whether this obsessive fear for one's health doesn't end up as a disease in itself! The moment you start worrying that you have drunk unboiled water you start imagining all sorts of little things moving in your stomach and before long you are ill!

But she says this only to herself. And sometimes she even reprimands herself for thinking such thoughts because this had been exactly her attitude when Mrs. Mutiro told her to take her little baby to the clinic to be given some injections against polio, whooping cough and tetanus. Somehow she hadn't quite believed that this was necessary. She argued that how can one cure something that wasn't there? But the fourth child, the one who came before Chipo, had died...

What Chizuva should have told herself, what she didn't want to admit, was that she was still a little bit afraid of hospital medicines, the legacy of her father's faith...

And when Chipo came, she forced herself to forget all that her father had told her. There wasn't a single week that passed without her searching out Mrs. Mutiro to ask about what should be done to the child next. Mrs. Mutiro had even laughed at her, saying that she jumped from one extreme to the other. But it was to them – Mrs. Mutiro with her bag of medicine given to her when she finished training as a health worker at Silveira House, and Mrs. Ngwarai with her advice on what kind of food the child should be given – that Chizuva felt the child owed her life, and she, Chizuva, her happiness.

It hadn't been only the children's health that they had looked after. They had also cured her – even if partially – of her almost fanatical belief in her parents' – or rather father's – blind faith. Not only that. She also owed what little confidence she now had to these two women. She had been so terribly conscious of her inability to read or write that, in self-defence, she had kept aloof from the other village women. The two women had cut through all that by taking her to almost every function in the village. At first, she had thought that if she wanted to knit, sew and cook she needed the Wednesday Women's Club; if she wanted prayers for her family then she should join the Church Mothers' Union on Thursdays. What she hadn't realised was that in a small village everybody knew one another. Everything, every activity that went on in the village was part of the total life of the people. She was now beginning to see a pattern that hadn't been clear to her. If the agricultural demonstrator wanted to say something about the advantages of keeping chickens, he didn't have to call a meeting of his own. He would just turn up at church on Thursday and address the Mothers' Union. And there and then Mrs. Ngwarai would talk of the importance of giving children chicken as part of their diet.

Everything that happened in the village was as closely related and interwoven as the ribs of a straw basket. It wasn't a surprise to hear that you had missed an important lesson on health, or the weaning of children, which had been given at the Women's Sewing Club. And the Village Councillor might give a very important message from the District Administrator at an Agricultural meeting... But most important of all, wherever people gathered, they discussed their lives and everything that was going on in their village... It was these informal talks that enabled the people to know who to choose if they wanted a chairperson, say, for the feeding scheme, or for the next village committee or health committee or who should go for training at Goromonzi as a village health worker and so on... Chizuva realised it really was like a stream, with no divisions in the flowing water.

It is true that she sometimes returned home from these meetings more depressed than elated, more despairing than enlightened. It is simply because people are different, Mrs. Ngwarai had told her. Some people cannot talk without their index finger always pointing at their own breast. They cannot understand that there are also other people with better ideas than theirs.

The tragedy is that people don't always elect for a post those people who do more work, but those who talk more about working. And when things start going wrong, they begin throwing live snakes at each other: it's you who voted for him, not I. It is the same as choosing seven businessmen to lead in the affairs of the villagers. These people are really interested in making profits and writing their names in bigger capital letters on the front walls of their shops. And why do people choose them in the first place? Awe, child. We are awed by smooth and persuasive talkers, we are awed by people who drink tea with buttered bread every morning. It is sad, yes.

Chizuva has certainly learnt a lot but still she knows a lot needs to be done if things are to move properly in the village. People cannot afford to keep on letting themselves be led by those who don't really care for their lives... She would speak out her mind at these meetings if she had the courage. Mrs. Ngwarai and Mrs. Mutiro have often asked her why she doesn't but she has told them she is shy. What she should really tell them is that she is afraid of being ridiculed. Once, she had asked a question and the speaker had turned on her. He drew everyone's attention to the fact that she had never seen the door of a classroom, that what she knew of ABCD she had overheard through the window of a passing bus. It had hurt her to the quick. And she noticed that it was the usual way these so-called 'leaders' (chosen by the people!) proceeded when someone challenged their right to lead: they simply turned the question inside out so that it made the questioner look ridiculous. And the most painful thing was that the people also laughed... As if they wanted leaders who speak below, above and around them.

Chizuva realises the sun is up. She quickly carries the rubbish she has been piling up in little heaps all over the yard to the rubbish pit. Yes, she will have to dig a new pit.

As she throws the last load onto the heap she hears the water pump across the fence squeaking.

Now, that is something she would definitely like to have, a pump like that. Even a three-year-old child can easily operate it and you don't have to always keep your eye on him lest he fall into the well. Mrs. Mutiro and Mrs. Ngwarai each have one like that. They were built for demonstrations, they said. Chizuva feels the load of the years on her as she remembers a line from the Bible: to those who have more, more will be added. Why didn't the government build these pumps in the homes of those people who have nothing? Like the latrines again. Mrs. Mutiro, Mrs. Ngwarai and a few other people had them built – for nothing. No, for demonstrations. She laughs but quickly shuts up, remembering that they had all been promised cement by the government if only they dug the pits and collected bricks. Two packets of cement, Mr. Mukarati, the health assistant had said. She knew that, but still... Mrs. Ngwarai had tried to explain the importance to health of these things. Think of the children, little babies, we used to bury here every month... Chizuva had thought about it and, vaguely, she had agreed that there definitely were less deaths of little children since she had come to live here, or rather, since the coming of the women on bicycyes with their medicine bags and feeding centre schemes and their health cards... Their health cards ... she had said it as a joke and Mrs. Ngwarai had laughed with her but later, alone, Chizuva had felt a little uneasy with the way Mrs. Ngwarai had laughed. Had she been laughing at that little painful incident when Chizuva had held Chipo's health card upside-down, unable to tell what it was all about? But Mrs. Ngwarai had simply taken the card and explained to her what the red and the green broad lines meant. Chizuva had felt so hot behind the ears that she hadn't been able to understand what Mrs. Ngwarai was saying.

Anyway, she certainly agrees that with the many health workers who visit them in their homes now, children can be quickly attended to, unlike the past when they had to walk all the way to Kovoyo clinic, almost ten miles away. And when you got there, sometimes you had to stand for hours in the queue, before you could be attended to. And in the meantime, your child was dying. She had seen babies who died in their mothers' arms before their turn came to see the medical assistants. She wonders when the two more clinics that have been promised are going to be built.

What she should really think about is washing her face, arms and legs and making breakfast for the children before they leave for school.

Breakfast is porridge: maize flour cooked together with *dovi* or peanut butter. While she is preparing it, the two elder boys are washing their faces, arms and legs outside at the washing place – a single rough-surfaced stone placed at the edge of the yard.

She would have liked to give her children some bread and tea, but there is no bread or tea in the house. Only a two-kilo packet of sugar that is now almost empty. Mrs. Ngwarai had told her that instead of buying tea and bread, she should use the little money she had to buy milk and sugar to add to the children's porridge. If there were any eggs ... but Chizuva cannot afford eggs daily. She wants to rear some chickens. What kind of a home would it be without chickens for visitors or her husband when he came home? Right now there are three hens just started laying. Well, an egg for each of them once a week should be enough.

All four of them eat in the kitchen. There is much laughter and the two boys fight each other for their mother's attention. The eldest is in grade six and the younger one is in grade four. They have been told to draw pictures on the subject of 'a clean home'.

The District Health Officials have announced an Inter-School Health Day competition and the pupil who draws the best picture wins himself some books, and his school some money, which should be spent on improving the sanitary conditions of that particular school.

Tatenda, the first boy, has drawn a woman who is scooping some houseflies out of a milk-pail with a grass broom usually used to sweep rubbish out of the house. The woman's five children are scattered all over the floor, all of them with their hands clutching their stomachs.

The younger boy's drawing is a child whose swollen belly fills half the page and out of it come matchstick-thin limbs and a matchstick-thin neck that supports a big head with very big eyes.

Chizuva feels that the younger boy's drawing has more meaning – or rather, it hits at her heart more – than Tatenda's. Maybe because it reminds her of Tatenda's condition when they first came to live here? She now looks at Tatenda and looks away ... the hospital helped and suddenly she remembers Mrs. Mutiro's medicine bag. Among the bottles of cough mixtures, ointments for burns and wounds and pills, she had seen a plastic double-spoon. The bigger end was for sugar, the smaller end for salt – and, was it a cup of warm water or ... ?

She makes a mental note to ask Mrs. Mutiro. Even if she weren't going to have another baby, her sisters had little babies and salt, sugar and water were not really medicine. She is sure her father's faith wouldn't forbid them to use these common everyday things that even he himself couldn't imagine going without. Chizuva smiles a little, remembering the number of cups of tea that her father can drink at one sitting... She tells the children that they are both going to get the prize and comforts Tatenda by telling him that his is certainly the better drawing but that is because he is much older than Ticharima.

And when Ticharima is grown up he will also be able to draw a picture as beautiful as Tatenda's. And, yes, Chipo, wait till you go to school and then you will show your big bad brothers that you can certainly draw better pictures than they can. Mrs. Gore is teaching you to draw at the playgroup centre? Good. No, you can draw for me in the evening when we all come back home. Now, eat up your porridge. Those who don't finish up all their porridge never grow up to be big girls...

The playgroup centre or the crèche – as everyone calls it here – is held at the local school, about one and a half miles away. At the beginning, Chizuva didn't feel at all happy with the idea of leaving her child in the care of someone she didn't know. But once again Mrs. Mutiro explained, she invited Chizuva to attend a Parents' Day gathering where the children put on a play about Christmas. Chizuva isn't ashamed to admit that she had shed tears at the beauty of it. And such little children!

The only problem now is that some parents don't seem interested in paying the one-dollar-fifty per month that would go into paying Mrs. Gore for her services. Chizuva knows – Mrs. Gore told her – that it isn't really the parents who don't want this project – although they, too, are always complaining of money and what they call the 'government's endless demands'! It is rather bad leadership and this again is the people's fault really, because they don't seem to know who to choose for what kind of job. How can you choose as secretary an old woman whose breasts are now dry and expect her to do a good job? Is it any surprise if she tells you as she always does – let those whose children go to the crèche pay the teacher because there is no-one who helped me bring up my own children? Is this the way a mother talks?

No, it isn't, Chizuva agrees, realising the number of things she can now do in the home without worrying about Chipo. Also, the knowledge that the child is being fed at the playgroup centre comforts her. But then this is exactly the problem. The parents have to get together and decide quickly on whether the crèche should continue or not. Very few are prepared to contribute towards the food that the children eat at the centre. As a result, Mrs. Gore has to dismiss the children after two hours – at ten o'clock – and send them back home to eat. If she had food, then they wouldn't go home till midday. Now, the irony of it is the children go back home at ten, their parents are busy at their daily tasks and they don't break till one or two for their midday meal. What happens to these little ones when they get home, hungry, at ten and there is nothing to eat or no-one to give them something to eat? Do you blame them if they develop the 'long-arm' habit and start ransacking neighbours' orange orchards?

Chizuva clearly sees it all ... she just hopes and prays that the Parents Committee will get their heads together, or even call in the Village Councillor to intervene, and settle this problem quickly...

Now, after breakfast, Chizuva takes Chipo by the hand and, with Tatenda and Ticharima running and playing ahead of her, takes the path through the village to the school.

There are five homes they pass through before they arrive at the school. The homes are separated by wire fences or a thin ridge of grass to show where one yard ends and the other begins. To an outsider, the homes might seem to belong to one man with several married children.

Most of the bigger buildings in the village are now running to corrugated-iron roofs, tiled roofs, or asbestos. Only a few still have the traditional grass-thatched roofs. Chizuva knows this is not always the case in most districts of the country but with the kind of working together schemes they have repopularised here, she doesn't see why it cannot be done. Not for the first time, she wishes her husband would come home...

As they pass through the village she exchanges greetings with the owners of the homes. They greet her by the totem of her husband, Samaita, and she returns the greetings accordingly. They laugh and joke and exchange titbits of information or comment on the unusually cold weather. Nearly all of them look forward to a year of plenty, with lots of rain, not like this or the past one. But, above all, they talk of the children's health. You can never omit asking about the children's health in any exchange of greetings, be it with foe or friend. After all, their ancestors left them a warning and a reprimand: it is only a witch who prays for the ill-health of another's child... And when all is said and done, what do we live for but the lives of our children? Chizuva reflects as she emerges into the view of the school from behind the low hill that hides it from her home.

Immediately her ears are assaulted by the sound of hammering, screeching wheelbarrows and the clanking of builders' trowels against hard brick, all this mixed with singing, shouting and laughter. She looks over to the right, some hundred yards away, where the parents are putting up the new secondary school buildings. Already two of the blocks have been roofed...

Tatenda and Ticharima say goodbye to their mother as they, too, separate to go into their respective classrooms. Chizuva looks after them until both have disappeared into their classrooms. She then follows Chipo who is prancing ahead towards the churchyard, past the teachers' cottages, where Chizuva can see Mrs. Gore already leading the three-to-six-year-olds in their daily song-and-play games. There is a rope swing and some motorcar tyres lying about, empty beer packs, powdered soap cartons and lots of tins. The children just don't have enough toys to play with, Chizuva remembers Mrs. Gore telling her once...

Chizuva raises her hand to protect her eyes from the sun which is now shining fully into her face. She just hopes she will be able to disentangle herself from Mrs. Gore's usual lengthy vehement attacks and not-always-fair criticisms of negligent and lazy parents 'who want everything done for them'.

She looks down towards and across the river, a little to the south, to see whether the *majangano* people have already started work at Mrs. Makudo's brickyard. She can just see two or three figures standing by the water-cart. Not yet started but they will be starting soon. Yes, she certainly has to cut short Mrs. Gore's 'constructive' harangue of the absent 'lazy parents' if she wants the *majangano* people to be on time when her turn comes. And her turn will be the one after the next, Mrs. Dziva's, in a month's time. If possible, she would like them to finish digging up and fencing in the vegetable garden on that same day. The planting is easy, Tatenda and Ticharima will help. After all, it is said that children have greener fingers than adults...

In Manggis

by Anita Desai

Anita Desai was born in 1937 and educated in Delhi. Her books include Fire on the Mountain *and* Clear Light of Day *which was nominated for the Booker Prize. Her work also includes two books for children* – The Peacock Garden *and* The Village by the Sea. *She is a member of the National Academy of Letters in Delhi and a Fellow of the Royal Society of Literature in London. Anita Desai is married with four children and lives in Delhi.*

The bus from Leksono follows the curves of the road as it climbs up the low, rounded blue hills of Central Java, passing through dense and tangled forest and tame and gentle tea estates with muddy roads leading through them to invisible villages. At one such curve there is the first inkling of something unusual ahead – a flat, beautifully laid football field amongst the tea bushes and the feathery-foliaged trees that shade them. Who could have made a football field here and who plays on it? The answer lies at the next bend in the road: a turning off the highway down a straight, cobbled road with a big sign picked out in coloured stones on the bank of the hill saying *Welcome to Desa Manggis*. The cobbled road was made, like the football field, by the people of Manggis, quite without any aid or instigation from the government or any organisation. It is a village dedicated to *gotong royong*, the spirit of mutual help and there is evidence of it everywhere.

The village road and lanes were cobbled three years ago by a system established by the *kepala desa*, the village headman: all men in the village spend one day in the week in community service and once a month the men of the four sub-villages that form a cluster collect to work on large projects that require more manpower. The men brought up smooth round stones from the valley whenever they came back from work in the paddy fields and the women and children were asked to bring up baskets of smaller stones whenever they came back from the spring in the valley. There are 2,282 people living in Manggis and even if all were not able to help, the work went fast and now there is not only this broad cobbled road leading off the highway, an all-weather road that can even take a bus or lorry, but straight lanes criss-crossing the village with broad bands of large round rocks on either side and a band of smaller pebbles in between. Minutes after a heavy downpour, it is possible to walk along them and keep clear of the mud and slush. The drains that draw off the rainwater are deep, well-made and lined with cement. On Sundays all the men in the village turn out to clean and repair them and keep them in good order.

The straightness of the roads and the excellence of their condition gives Manggis an exceptionally spruce appearance. The houses are also large, solid and well-constructed: they have brick and cement walls that are painted white, red-tiled roofs, picture windows, sun-louvres and well-fitting doors; each bears a plaque that proclaims it '*Rumah* Type A' or B or C. The blueprint was supplied by the government as well as an annual village development subsidy that was 150,000 rupiahs* when the scheme began but rose to 1,000,000 rupiahs this year. Still an insufficient sum for any complete project, the subsidy serves as an impetus to development work which has then to be carried out and completed through the determination and enterprise of the villagers. Each village could use it as it thought best, as long as a record was kept of expenditure, and Manggis has used it variously to construct houses, roads and drains. Once Manggis received thirty slab latrines from the government which provided a model which others copied so that there are now many such cement slab latrines built over deep pits in wooden outhouses, but they still lack running water. Some of the houses have blue-painted window-frames, some have a tangle of roses and dahlias in their gardens and almost all have a row of clove trees in front of their houses – beautifully shaped, glossy-leaved and covered with clusters of pale green buds that are picked and dried and sold for 10–15,000 rupiahs a kilo. This is often the only cash crop of the farmer – the rice grown in Manggis is considered too good to be sold – and the trees are meticulously cared for, no weed or vine allowed to straggle near them, the clay yards kept bare and clean except for the chickens that run free everywhere.

This appearance of well-being and progress was not achieved without thought or organisation and the man behind it is evidently the *kepala desa*, the youthful-looking Nikun Nariowinoto whose close-cropped head and smart polyester safari suit speak of his military background. He was a sergeant in the army when he was recalled by the village to stand for the election that he won with an easy majority. He admits, with a deprecatory smile, that his experience in the army has helped him since: 'It taught me the need for organisation, close supervision and inspection.' After a bit of thought, he adds: 'My grandfather and father were headmen of the village, too. I learnt from them as well."

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*100 rupiahs = 10 cents.

There is nothing of the hereditary chief about Pak Nikun, gentle, soft-spoken and self-effacing to a fault. If his career in the army was as successful as in the village LKMD (*Lembaga Ketahanan Masyarakat Desa* – Village Community Resilience Committee) then it must be due to his belief in discipline and co-operation rather than to anything commanding or peremptory in his manner.

Yet when he makes an announcement on the public address system that he has rigged up outside his house with a battery and a loudspeaker – there is no electricity in Manggis – he draws an enviable response. At six o'clock on a workday morning, a team of volunteers collects in the yard outside his house to take the overalls, gumboots and hardhats that he hands them, mix Funitrithon and fill their spray guns. Then, while he announces on the loudspeaker which half of the village is to be sprayed today and which tomorrow, they set out and start spraying. The women hastily turn out their kitchens and roll up mattresses to put in the sun since the pesticide trickles down their walls and spreads across their floors and furniture in the battle against mosquitoes that cause such a high incidence of malaria in the region.

In the four years that Pak Nikun has been the *kepala desa*, certain customs have been established. At one end of the village square there is a curious tin box on top of a stilt, rather like a bird house except that it is kept locked and opened only once a week – to reveal a television set. It is the village set provided by the government and is turned on for the whole village on Saturday evenings so that they can watch their favourite programme although it costs Pak Nikun personally 3–5,000 rupiahs in petrol to run the generator on which it works. At five o'clock the children start collecting on his veranda. By six o'clock they are spilling into the square. By seven men and women have put away their work and joined them. By eight o'clock the square is milling with an excited audience and the hubbub is tremendous. When Pak Nikun starts the battery there is a gasp of delight, a moment's gratified silence and then everyone settles down to watch till a very boring English lesson given by a very boring young man at the central television station in Jakarta is over and the best show of the week can start – a serial based on Javanese history and legend that combines comedy and high tragedy in the characteristically Javanese way. The well-known episode from the history of the Madjapahit dynasty in the thirteenth century commands breathless attention. A wicked younger queen plots to discredit the older queen, the weak and corrupt king is manipulated and fooled, a maid does a disco dance, a handsome prince falls in love . . . there is high drama, posturing and eloquence from royalty dressed suitably in ornate costumes, interrupted now and again by the antics of clowns who blunder onto the stage, make everyone rock with laughter at their clumsiness and converse on such topical and prosaic matters as soil erosion, afforestation and immunization. When the show ends – with justice for the honourable and retribution for the wicked – the audience stays on, even though the incomprehensible American soap opera and an interminable cowboy film eventually has everyone stretched out on the packed clay of the village square and on Pak Nikun's veranda, contentedly asleep under the big milky stars that hang so low in the black Javanese sky.

All this while Pak Nikun has been sitting up at the green wooden table inside, tapping out reports on his typewriter, seeing members of the LKMD and planning out the voluntary service for the next day. At six o'clock on a Sunday morning he has one hundred men gathered together with picks and shovels and goes with them to a steep road through the forest that the daily heavy rain has made too slippery to negotiate. He works with them at cutting down the wild monsoon growth and clearing the ditches. The only men who do not join in are his brother, Pak Sardono, who smokes a cigarette and watches from under his wide-brimmed hat with a certain cynicism, and Murad, the only university graduate in Manggis, who cuts a somewhat helpless and ineffectual figure as he stands by holding an idle pick. The only sound to be heard apart from the digging of the picks and shovels is the incessant shrilling of cicadas and every now and then a great flamboyant butterfly or an iridescent dragonfly flutters over their heads. The perfect azure-blue cone of Mount Sindoro hangs suspended in the brilliance of the morning light that by noon turns to liquid heat trickling down their necks and backs. But by then they have worked their way to the bridge over the canal in the valley that separates Manggis from the next village. Then it is time to bathe and prepare for the Sunday afternoon football match.

Pak Nikun does not appear to have any time left over for farming although he has been given four hectares of land by the village in lieu of a salary. Who farms the land and brings up baskets of grain for his granary? He explains 'I never go to see the land. You see, it is mine only during my tenure as the headman. At the end of it, I will go back to the army – I am on leave now – and the land will go to the next *kepala desa*, so it's best I don't grow too attached to it as I would if I were to work on it. I hire labourers to do the farming and I give them half the produce and take the other half.'

He certainly needs it since an endless stream of visitors flows through his house, stopping to drink tea and eat fried rice-flour *krupuk* or share meals. The more formal guests such as visitors from other villages, from the health centres in Leksono and Wonosobo and officials from UNICEF, are seated on the rexine-covered sofa alongside glass-topped coffee tables in the front room and served tea and peanuts. Friends and relatives from the village go straight to the earthen-floored kitchen at the back of the house and sit down at the wooden table and drink tea while they watch Ibu Sutinah, the *kepala desa*'s wife move about the big, shadowy, tile-roofed room, counting the baskets of rice and maize that are brought in during the harvest. She helps her little maid feed the single earthen stove built on the floor with long pieces of the pale, soft wood from the *albasia* trees that shade the coffee and tea plants, cutting vegetables and grating coconuts and shelling corn cobs, brewing tea, working at her sewing machine and taking her turn at the little co-operative grocery store in a corner of the kitchen that is run by the PKK (*Pembinaan Kesejahteraan Keluarga* – Family Welfare Programme Organisation) of which she is president.

Here she sells, along with packets of tea and *jamu* – the popular herbal cures for all ills from the common cold to wrinkles – packets of iodated salt that UNICEF has been trying to popularise all over Indonesia to fight the prevalence of goitre. Iodating salt is still an expensive procedure and this puts up the price of salt so that people often choose to buy the cheaper untreated variety although they can see cases of goitre and cretinism all around them, but the PKK sells these packets at a little less than the market price, making it an easy choice for housewives. A few bunches of bananas hang from the kitchen rafters above the little shop and there is a big basin of the coconut oil that is the common cooking medium. Housewives stroll in to do a bit of shopping and stay for tea and a chat. The PKK members take turns at keeping shop and at the end of the day whatever money has been earned is halved between the shopkeeper for the day and the co-operative.

Ibu Sutinah appears to have quite enough work to keep her in the house all day, but as president of the PKK her activities take her out into every corner of the village. On Fridays she and other members of an inspection team set out to make sure houses are swept, rubbish carried away and burnt, latrines washed and cleaned, windows kept open and bedding put out in the sun to air. She is following the old Indonesian tradition of good-neighbourliness that has become official through a government rule that the wife of every official, whether in the administration or the military, must do voluntary community service. Neither the wife of the president of the country or of the village LKMD is exempt, so that a huge unpaid labour force has been created throughout the country. It is estimated that there are 250,000 voluntary workers in Indonesia. Nor is this mere dabbling to salve the conscience, as in all parts of the world, particularly the affluent ones, but actual service: the official's promotion depends in part on his wife's performance and can be held up if the latter is considered inadequate. The wife sometimes acquires such a fine reputation for her efficiency and achievement that her husband's career prospers on its strength. This importance given to the wife's achievement in the field of social work is felt to be a recognition of her traditional role and is generally considered sufficient reward in itself. The women are pleased with the status newly conferred upon them for work they have always readily done and find the experience enriching as well since it enlarges their world beyond home and field.

If there are some murmurs of protest at this system it is not surprising that it comes from men rather than from women, who have never been paid for their labour and do not expect to be paid now. It is Taufik, the curly-haired young family planning worker from the health centre in Leksono, the sub-district headquarters, who has come to Manggis by bus for the day, who feels that voluntary workers – or 'cadres' as they are generally called – ought to receive some payment or incentive. Taufik is himself a paid government official wearing the government uniform of navy blue trousers and light blue shirt, and has come to check the supplies of the young man elected by the Manggis LKMD as their health 'cadre'. Dressed in a T-shirt and the baggy pants of a track suit, Antoro looks more like an athlete than the 'barefoot doctor' he is, in a way, even if he is not barefoot or a doctor. He happens to be on the Manggis football team as well.

Taking Taufik into his house – Rumah Type B, overgrown with a bleeding heart creeper and sweetly scented by some lilies at the door – Antoro shows him his medicine cabinet that hangs on the wall beside the ubiquitous Japanese calendar with the smiling model displaying a motor cycle, a television set or some face cream. It contains a bottle of mercurochrome, several tins of quinine tablets, packets of Oralite that UNICEF has been importing and distributing all over Indonesia as a simple cure for diarrhoea (the commonest threat to human life particularly during the vulnerable period under five years of age) and oral contraceptives, for Antoro is the local family planning 'cadre' as well. He has a map hanging on the wall that he has made himself, showing every house in Manggis, which has some 400 families. Each has a red, blue, yellow or dotted green outline, indicating the family planning method employed by the couple living in that house – condoms, oral pills or, most commonly, IUDs. These are matched by small tin plaques nailed to the doors of all the houses, showing the same colours, so that the 'cadre' can tell at a glance what contraceptive is used there and can keep the couple supplied from the stocks that are replenished regularly by Taufik when he comes from Leksono. In villages where oral pills are commonly used, a wooden gong is beaten at a certain time every evening to remind women to swallow their pills. In Manggis IUDs have brought down enrolment at the primary schools from 90 to 45 in just a few years. Every family pays 25 rupiahs a month to Antoro to help pay for the medicines. When he found this inadequate and raised the sum to 50 rupiahs there was much grumbling and people stopped paying so he reduced it again to a sum that he finds everyone parts with readily. This is typical of the realistic attitude taken both by the volunteers and the government, pressing people to do only what is possible and achieve targets that are not impossible. The limitations inherent in the system are recognised but not allowed to act as discouragements. Antoro can only give advice and first aid; any severe case would have to be sent to the health centre at Leksono, 20 km away. This has an outpatient department but no beds and although a patient could be accommodated for a night or two, anyone requiring more attention than that would need to be sent to the hospital at Wonosobo, the regency headquarters 80 km away.

Having replenished Antoro's stock of contraceptives and pills, Taufik goes across to Pak Nikun's for a glass of tea. While there, a health 'cadre' from a nearby village arrives with an inventory of her medical supplies. As they sit counting out vitamin A pills, iron folate tablets, glass slides and quinine, and entering the records in their registers, the first clap of thunder is heard and the sky darkens with the usual afternoon clouds. Both stop and look out of the window at the drops of rain pattering onto the clove tree leaves outside and streaming down the picture window glass, when there is another loud clap — this time not of thunder but of a wooden gong. It brings Ibu Sutinah out of the kitchen to tell Taufik it is time to go up the lane to Ibu Muharno's for the monthly weighing session.

Are any mothers likely to come in the rain that is now pouring down on the tiled roofs and gushing down the lanes? They worry as they walk hurriedly along under their umbrellas, passing villagers who are sheltering under their big straw hats or even under long, trailing banana leaves. The monthly weighing of children under five – *balita* – was started in Manggis by nine or ten of the most enthusiastic and energetic out of the twenty-six trained 'cadres' when they heard of such a system being introduced in other villages. Since no records were kept, the programme had been rather desultory and naturally the mothers had not seen much point in it and therefore given it little support. Then UNICEF had stepped in and supplied the growth charts in which babies' weights were to be entered regularly, as well as records of their illnesses and immunization. Twelve million such cards have been distributed all over Indonesia. These growth charts or KMS (*Kartu Menuju Sehat* – 'Towards Good Health' card) have become the heart of the programme to which UNICEF has given the useful mnemonic GOBI-FF and covers Growth Charts, Oral Rehydration Therapy, Breast Feeding, Immunization, Family Planning and Food Supplements. These also happen to be the elements of the Family Nutrition Improvement Programme, the UPGK, which has been devised by the departments of Health, Agriculture, Religion and the National Family Planning Board. Since the village health and nutrition 'cadres' implement both programmes, they have actually brought together a service that now covers a third of all villages and one half of all children in Indonesia and by the end of the Fourth Five Year Plan, the Repelita IV, will cover all children under five in all villages. Malnourishment affects forty percent of pregnant and lactating mothers and a third of all children in Indonesia, often not visibly but perniciously, gradually weakening their resistance to prevalent diseases like diarrhoea, pneumonia and malaria, so that infant mortality is still high at ninety eight per thousand. It is being tackled and monitored by the village 'cadres' who use, as their centre for operations, the *Pos Penimbangan Balita* – the weighing post – of which Manggis has four.

All the mothers appear to have arrived at Ibu Muharno's at once, in response to the clanging of the wooden gong and despite the rain that is drumming on the roof and giving the session the air of an emergency, a rather enjoyable one. They have babies snuggled at their breasts and infants tied to their backs in sarongs or led unwillingly by the hand and each is carrying a KMS. One's first reaction on seeing it is 'It's too pretty to be used, it will only be put away like a picture or photograph'. It is an attractive, glossy folder with clear, cheery pictures on the outside illustrating breast feeding, kitchen gardening, the administering of vitamin A and the correct mixture of salt, sugar and boiled water for oral rehydration therapy; on the inside is the rainbow-coloured chart on which a child's weight is recorded. It is, in fact, its very quality and attractiveness that makes mothers preserve it carefully in a plastic envelope and bring it along faithfully on each weighing day, once a *selapanan* – the Javanese month of 35 days.

Ibu Muharno, a young woman with very black, very bright eyes, has been out in the fields since six o'clock, helping with the paddy harvest, but now she is sitting at a wooden table in the front room, dressed neatly in a brown shirt and tan skirt, laughing at the commotion. Her children, just back from school, line up on a bench to watch. The family dog has been tied up in the next room and is yapping in protest. As each mother comes up, she hands the KMS to Ibu Muharno and her baby to plump, laughing Sugiyanto who stuffs it cheerfully into the blue plastic pants that UNICEF has supplied along with the *dacin*, the weighing scales of the kind commonly used in the market place, hung from the rafters. Suspended in mid-air the baby bawls in terror and Ibu Muharno has to jump up and help adjust the wildly jiggling scales and cut short the ordeal for the baby. A month ago, a visitor from the UNICEF office in Jakarta, the Home Food Production project officer, Alan Court, had been so disturbed by the babies' loud protests that he had designed a wooden tub as an alternative to the weighing scales. The Manggis carpenter has built four of these, one for each *Pos Penimbangan*, out of the sof[illegible]-purpose *albasia* wood, and the older childre[illegible] lifted into one of these, their legs thrust through two holes at the bottom. A few of them manage to endure this in stoical and wondering silence but others kick and buck and make it difficult for the 'cadres' to adjust the scales. There are also a few infants so small that they can be placed in neither and for them Ibu Muharno runs and fetches a sarong sewn into a sling into which she carefully inserts the baby and dangles it from the scales, keeping her hand underneath in case it slips.

As soon as the weighing is done, the KMS is opened out on the table and the weight recorded on the chart. One need only glance at it to see if the child is gaining weight as it should or not. The weight of an healthy child should run parallel to one of the coloured bands – from yellow to blue – on the KMS. A child whose weight graph has not risen needs better feeding. 'Mix some beans or cassava leaves with the child's rice,' the 'cadre' tells the mother, 'or give him some soya bean cake or eggs.' If a child's weight has fallen, the mother is asked if the child has been ill. Of the 27 children who have come to be weighed, only two show a decline in weight although not below the red line of danger in the KMS which would indicate a visit to the health centre. In both cases the mothers shake their heads and say no, the babies have simply lost their appetites and are not eating well. 'Make them eat more! Give them plenty of food!' the 'cadres' call over the milling heads in the small room and the mothers vanish, looking harrassed and worried. It is the mothers of babies who have gained weight who linger on, beaming happily and staying to chat. One delicately pretty young mother has brought two enormous, moon-faced daughters who have to be lifted into the tub and show triumphant weight gains; she is clearly the star mother. Another young woman, plumply pretty, has brought her three-month old daughter for the first time, wrapped up in newly knitted woollens of pink and green. She is presented with the rainbow-banded KMS and has the baby's name filled in proudly: Ruwah, the newest member of the *Pos Penimbangan*. It is obvious that the weighing session is popular with mothers of healthy children who are a credit to their homes and families, while the mothers of sickly children whose weight has declined feel disappointed and ashamed and hurry out, looking as if they will not return. The 'cadres' will have to go to their houses on private visits to persuade them to return and help them with their problems if they are to fulfil their twin duties of administering to the undernourished and monitoring their state of health.

One of the ways in which they have tried to popularise monthly weighing – and the KMS, which had earlier shown irregular attendance, appears to be growing more popular in recent months – is by providing a nourishing meal to each baby that comes. This is only a remnant of an earlier scheme of supplementary meals whereby undernourished babies were to be fed regularly at the *Pos Penimbangan* till they showed weight gains. The scheme proved better in theory than in practice because mothers did not have the time to bring children along for daily meals and were reluctant to leave them behind for any length of time. Now the 'cadres' have prepared a big bowl of rice gruel with peas to which the mothers have contributed 10 rupiahs each, and each child is being handed a bowl of food as soon as it is weighed. Some of them are still too upset by their ordeal to be pacified and have to be taken out onto the veranda to be fed in safety, while others stick their fingers in and lick in happy anticipation. The charts that hang on the wall and the flip-charts that lie on the table all advise mothers to breast-feed their babies for as long as possible to avoid the dangers inherent in bottle-feeding which is so often unhygienic and not nourishing unless correctly prepared. This advice seems somewhat gratuitous in view of the fact that all Manggis mothers appear to feed their infants quite naturally since any other kind of milk is either unobtainable or prohibitively expensive. A new concept that requires more persuasion and encouragement is that of early weaning to solid food and the adding of nutritious foods like leafy green vegetables – the cheap spinach *bayam* and *ketela* or *kelor* leaves that grow everywhere – peas and beans, eggs, salt fish and fruit to boiled and steamed rice or maize flour at an early age. These mothers have already learnt and accepted the benefits of regular weighing, of oral rehydration therapy – all of them can describe the procedure as they have been taught – and of vitamin A and iron folate tablets and there is no reason why new nutrition patterns should not be accepted as well. All that is required is their availability.

Apart from advice and information regarding nutrition, the 'cadres' have to check each KMS to see if it is time for the baby to be given its vitamin A capsule which is administered once every six months to combat night blindness which was once rampant. People called the children afflicted by it 'chickens' because of the way they stumbled around helplessly after dark. The age-old method of dealing with it – waiting till the 'chicken' had fumbled its way to the door and then tapping it lightly on the head with the kitchen pestle – was seen to be drastic without being effective and so the mothers help to open their babies' mouths while Ibu Muharno cuts off the tops of the capsules and pours in the contents. Pregnant mothers are supplied with iron folate tablets to fight the other common deficiency disease, anaemia. These are carefully counted out so that supplies can be called for in good time.

Records of the babies' immunization have to be entered at the bottom of the KMS as well. Vaccines to immunize children against diphtheria, pertussis, tetanus and tuberculosis are administered by a UNICEF-trained, government employed vaccinator who serves 31 villages in the Leksono sub-district and must be the most hectically itinerant of the health workers in the region. The 'cadres' are having trouble in finding time to copy out the government records kept on slips of green paper into the more durable and comprehensive KMS. 'If only we could keep one single record, it would save so much time,' admits the hard-pressed Ibu Muharno to Taufik. Taufik sits at the table beside her, copying down her records of weighing and immunization into his own registers. He will return to Leksono to enter them into the sub-district's records which will be collected along with data from the other villages and sent on to Wonosobo and from there to the provincial headquarters at Semarang and finally to the ministry in Jakarta.

It is the first step of this journey he takes when he goes down the veranda steps into Ibu Muharno's garden after all the mothers have left. The rain has stopped, the clouds are rolling down the hills to settle in the valley for the evening. The clove trees glisten with rain drops and chickens run everywhere in search of worms. It is these chickens that make it so difficult to start a kitchen garden again after last year's drought killed all the bean vines and tomato plants. 'I'm waiting for the cassava to be harvested,' then I'll have enough stalks to build a fence and sow seeds again,' says Ibu Muharno, coming out to see him off. Cassava makes the best fence of all – it catches root immediately, putting out more tubers to be harvested later and leafy green tops that make such nourishing food as well as serving as an excellent barrier to the chickens. Seedlings can be had from the government nursery at Leksono, and seeds and technical advice from UNICEF's Home Food Production project officers. 'As soon as the harvest is over, I'll plant beans, peas, tomatoes, aubergines, marrows, gourds and spinach again – and herbs for *jamu*,' says Ibu Muharno as if she has large acres at her command instead of a narrow clay strip around the house, because intensive farming is an Indonesian tradition and she knows how to make the best of each inch of land. She is so keen on a kitchen and herb garden that she will undoubtedly find the time in between farming, cooking, fetching water, training and all the PKK activities in which she is involved, and asks only for land, water and kind weather.

The children who are too small for the attention of the *Pos Penimbangan* receive it from the *dukun bayi* – the traditional birth attendant of the village who had begun her training under the old *dukun* and then gone to Wonosobo every Wednesday for a three months' course in midwifery. UNICEF provides the training aids and material for the courses, which are held at health centres. That was in 1980. Since then she has seen twenty babies into the Manggis fold and claims that they are all alive and flourishing, for she not only attends the birth but to the simple ailments of mother and child and their health and nutrition as well.

Ibu Murtan is 40 years old, a spare, dark woman with a fine, serious face, her hair brushed back as neatly as any hospital nurse's and dressed in a brown kain with a very white top. She brings out the kit she has put together out of her own earnings (most trained *dukuns* are presented with UNICEF kits on completing their training but there was a temporary shortage of them that deprived her of one) and her little wrinkled husband smiles proudly from under his round black cap as she displays it: two large green enamel basins, a pile of worn, faded, washed and clean baby clothes tied up in a napkin, bandages, gauze, mercurochrome, a tin of salicylic talcum powder, a pair of scissors, methylated spirit and a spirit lamp. The latter are responsible for her high rate of success: ever since she – and some 68,000 other *dukuns* – learnt to sterilize their instruments, the rate of neo-natal tetanus, one of the chief causes of infant mortality, has fallen drastically. Grateful parents pay her whatever they can, either in cash – anything from 5 to 1,000 rupiahs – or in kind – grain, poultry and eggs. 'I keep everything clean,' she insists while her husband nods and smiles in proud agreement, 'and I visit the mother and baby every day till the umbilical cord falls off. Even after that, I keep up my visits. That is why mothers want *dukuns* to deliver them rather than go to the health centre or the hospital.'

Having outgrown the ministrations of the *dukun* as well as the *Pos Penimbangan*, the children enter one of the two primary schools in Manggis and come under the care of the trained health workers who teach them simple rules of hygiene and check them for scabies, ring-worm, night blindness and anaemia and treat the cases that they see. 'I have seen children grow healthier ever since the programme began in Manggis,' says the health worker at the school on top of the hill. 'There used to be more sores on their bodies, more anaemia, more disease. Now if children are absent from school, it is usually on account of influenza, diarrhoea or malaria,' and admits there is little she can do about these but treat them when they occur.

The children running around the playground look splendidly free from disease. They are chasing insects in the school garden, attaching threads to the great glittering beetles that they catch and leading them around like pets. When the bell rings, they troop in for lessons – science, maths, hygiene, the Javanese language in the first three classes and *bahasa Indonesia* in the next three. Some of them settle down to learning the art of making decorative pieces out of palm fronds and bamboo strips; a little boy gazes in awe at an enormous green grasshopper complete with antennae and bent legs that he has fashioned out of some fronds and grass blades.

The school keeps children from age six to thirteen, from class I to VI, when they have to go on to the junior high school. As the nearest one is at Leksono, a twenty-minute drive by bus that costs 150 rupiahs, the number of Manggis's schoolchildren drops from 1019 at the primary school to just 23 at the junior high school. When it is time to make the next move, to the senior high school at Wonosobo, the number drops further to 13. There is a single university graduate, now a teacher at Leksono. So to all intents and purposes a villager in Manggis can expect to have six years of schooling and is unlikely to have more. The per capita income per annum in Manggis is US$ 132 and it is naturally difficult to decide to spend six dollars or more out of ten in a month on bus fares. The first six years are considered sufficient to acquire literacy, but there is a real danger of slipping back into illiteracy and so a number of non-formal education classes have been formed for adults who have either not had any schooling at all or lost the little they had in years devoted to farming and manual labour.

Ibu Salbiyah, the headman's niece, teaches one of the several non-formal classes in Manggis. Some are held between 2–4 o'clock for women since that is the time when they are free from both housework and farming and some from 7–9 o'clock for men who find the evening hours more convenient. All classes are suspended during planting, harvesting and the fast of Ramadan. Ibu Salbiyah's class of ten is at many different levels of reading skill. Some have had a few years at primary school ten or fifteen years ago but dropped out, and others have completed primary school but so long ago that they need a refresher course. The loud-voiced, gold-toothed supervisor who has come to superintend the class refers to them all, frequently and loudly, as 'drop-outs.' It is unfortunate that this one phrase amongst all other English phrases has taken root here since every time he uses it the students squirm with embarrassment and the children peering in through the window roar with laughter.

It takes determination to ignore the derision in the laughter and Ibu Salbiyah is determined: she quickly hands out books from the *Paket A*, a set of twenty graded booklets designed by the ministry of education with UNICEF advice and assistance, and they open them out and start reading. They begin with the Latin alphabet of *bahasa Indonesia* (the national language), the time, and numbers, and go on through simple lessons in dialogue form on practical and relevant subjects such as tailoring (of children's clothes, with fingers and hands for measurement, and designs for Indonesian garments), nutrition (there is a picture of a sick man being approached by an orange, a banana and a papaya all saying 'Eat me and you'll get well!'), kitchen gardening, compost heaps, savings (with lessons in accounting and book-keeping), afforestation, fisheries, poultry farming and family planning. Each lesson ends with a questionnaire that deals with grammar and comprehension and includes small sums: counting pills, dividing fruit, weighing grain and so on. The books are models of clarity, simplicity and practicality. Once a reader has gone through them – all Ibu Salbiyah's pupils are at different stages of progress – he is considered ready to take the primary school leaving examination.

If he wishes to continue his reading, he would have to go to the library which is tiny and housed in one of the village houses and opened on request. The books and pamphlets are few and simple, all deal with village life and are therefore of immediate and practical interest to their readers, although they cannot be said to involve either the imagination or the spirit. For the first, people still turn to *wayang*, the dance, drama and puppet shows that contain all the colour and heroics of the ancient Hindu epics, the Ramayana and the Mahabrarata. These are performed at every opportunity to the haunting music of the *gamelan* by the light of burning torches that transform Ibu Sugiyanto, by day busy in the paddy fields and at the village pond and in the *Pos Penimbangan*, into a princess clad in gold, narrowed eyes glancing seductively over a bare shoulder into the shadows that her flickering hands dismiss into the past.

If in search of the spirit, they must go to the single mosque, a large wooden village house set well back from the main road that would not be noticed if it were not for the distinctive sounds that emerge from it at fixed hours of the day – the calls to prayer five times in twenty-four hours and, in between the evening and the night prayers, during the heavy, soft dusk, the murmur of the Koran recital by lantern light. Although most children in Manggis have to help their mothers fetch water and mind baby sisters and brothers, or play in the village square and chase dragonflies in the forest, there are about twenty or thirty girls and boys between the ages of 6 and 16 who gather in the mosque every evening and, seated on mats around low wooden tables that hold open copies of the Koran, keep their heads covered as they laboriously read aloud in sing-song voices, helped by the elderly Imam and some of his scholars. The Arabic script is studied for no other purpose than for deciphering the Koran and it does not come easily but eventually these evening gatherings of children by lamplight do bring about a familiarity with the holy scripture that their parents desire them to have, and so the Islamic tradition is carried into another generation.

What is new is that the flow is not in one, time-honoured direction alone any more; new ideas are being fed into the stream to flow back into the old traditions, giving them unexpected colours and dimensions. It was clear to the government that the new ideas in health, nutrition and family planning would have to be incorporated into the traditional system if they were to become a part of the lives of the people, and the co-operation of the religious leaders of the country would have to be sought. A UNICEF-financed study by Muslim scholars was conducted to unearth all references to nutrition (*Gizi* in Bahasa Indonesia, obviously derived from the Arabic word for food – *gidzi*) in the Koran and the Al Hadits, the discourses of the Prophet as related to his disciples. These were published in handbook, 'Islamic Views about Nutrition', which is now being used by the government to make the UPGK schemes popular. It is a handsome green book bearing an elegant logo of a breastfeeding mother drawn in Arabic letters. The Imams themselves are being trained in nutrition and family welfare work through special learning groups in each sub-district. The LKMD tries to further the two-way communication between leaders and community by sending their workers to the Imam for religious training, thereby creating an interaction that makes the latter more aware of the problems faced by the former. In another subtle manoeuvre, a family planning worker in Wonosobo found it useful to recruit volunteers from the families of the religious leaders – a wife, a daughter or daughter-in-law – who would bring such unorthodox ideas as family planning into orthodox religious homes. Abortions were never made part of the scheme for fear of offending religious sentiment and stress has been laid on preventive measures such as contraception instead. The fact that many couples now ask for abortions makes volunteers hold their breaths as they wait to see how far such 'progress' can go before it is seen as unorthodoxy.

This psychologically artful approach has brought together the mosque and the community in unexpected fields in which the spirit of co-operation is indispensable. Success depends of course upon individuals and their willingness to co-operate and there have been refusals and failures just as there have been achievements. Each village can relate its own history and drama.

All become absorbed in the pattern of life as it continues to exist in the village and neither the calls to prayer nor the beating of the wooden gong dominates it to the extent of the sound of water – falling, splashing, flowing. It is water – whether in a well, an irrigation canal or in a still pond – that attracts and collects life at its edges, and water that rules it and sustains it.

The day begins not with the rays of the sun or the call of a bird but with the clink of a bucket and the splash of water. At four o'clock in the morning, long before daybreak, lanterns flicker and bob across the village square as women come to collect water at the tank. Dogs wake up and begin to bark, ducks begin sleepily to quack. When the sky lightens, the village is already stirring and many are streaming down the lane to the valley, the men carrying their farming implements and the women their buckets and basins. They turn off the village lane down the broad road that runs through groves of clove trees and bananas to the valley where the paddy fields are fed by irrigation ditches in which muddy red water rushes past the banks. A small cement dam has been built at a slight elevation to feed the single hydraulic ramp pump that sends water to the tank up in the village square. The village won it as a prize in a community development competition. It stands in a small tank, fed by a pipe from the dam. The water is forced up to a pipe at a higher level and the waste water charges out into the tank with a loud clap of the metal covering. Since the water is the same red and muddy water that the irrigation ditches bring, it is not considered fit for drinking and so the women who bathe and wash at the village tank still come down with their jugs and kettles to fetch drinking water from the spring further down.

The spring fills a tranquil pond surrounded by drooping banana trees and flowering hibiscus bushes. Scarlet, silver and night-black fish flicker in its shallows and although it is thought to be pure it cannot possibly remain so since women in sarongs, hair tied up in knots and decorated by flowers, bathe and do their washing at its edges before filling their water vessels. A large part of every woman's day is spent beside one source of water or the other and children, after being soaped and bathed, help carry the filled vessels uphill.

By this time a group of women has collected at the wooden post where the village gong hangs from the beams beside a chart explaining the different beats which mean, variously, natural disaster, armed attack, the appearance of robbers, public meetings, etc. They have brought baskets of cooked *tèmpè* and *tahu* soya bean cakes, and the women from the spring stop to buy them, resting for a while with their heavy buckets. Chickens scratch and cackle in the dust, children climb onto the wooden bench and jump down. An old lady whose face is webbed with deep wrinkles under a great turban of batik cloth, comes driving her flock of ducks along. She is taking them to paddle in the rice fields for the day, driving them with a stick that she will plant in the mud to show them where they must stay. They are not very obedient and scuttle from side to side, the ducklings scampering after them the best they can, but eventually they vanish down the lane into the moist green valley.

The entire valley, as far as the eye can see, has been cultivated painstakingly in narrow terraces that follow the curves of the low, round hills. The brilliant sunlight pours down onto the bent backs of the women who are harvesting the rice. They hold small lengths of bamboo to which blades have been affixed crosswise, cutting each stalk separately and collecting the stalks in their left hands with as much light delicacy as if they were flowers. At the end of the row, each handful of stalks is laid carefully on a spread mat so that no grain falls and is lost. In rows, fanned out to dry in the sun, they make a pattern that is repeated on the kains, usually in the same earth-and-paddy colours of rich clay-brown and pale straw-yellow. Paddy and earth, water and harvest make up the pattern and the pattern is treasured.

Not only is every inch of land cultivated with the same kind of intense care, but even the banks that divide the fields hold their own crops – rows of beans or the cassava plant, each part of which is used or consumed – tubers, stalks and leaves. Up in the higher reachers, the slopes of the hills are planted with tea and coffee bushes interspersed not only with the fine, feathery *albasia* trees that shade them but with banana, papaya, lemon and guava trees, taro and cassava, winged beans and peppers. Most of the produce goes to feed the family that farms the land but some has to be sold for cash. An *albasia* tree that is 15 or 20 years old can be sold for 15–20,000 rupiahs. The coffee plant yields about a kilo of beans that can be sold for 1,000 rupiahs. It is not much, it is very little, and families must keep their expenses low. There is only one shop and two or three window kiosks in Manggis to sell salt, tea, rubber slippers, straw hats, *jamu* and torch and radio cells. Whatever else is needed must be grown or raised.

'But how much can a family raise on a quarter hectare or even a half hectare? That is all most families are left with now, if they have any land at all. When we were young, our fathers were able to leave us one or two hectares of land but with each generation this has become fragmented further. What will the next generation have? What is the future?' asks the headman's elder brother, Pak Sardono, who is the Vice-Chairman of the LKMD and himself appears to be the most prosperous man in Manggis. His blue and white painted house is certainly the largest; its furniture – of shining metal, set on wheels and upholstered in green velvet plush – the most resplendent; and it is not situated in the narrow village lanes but on a promontory by itself, in three quarters of a hectare planted with clove trees. He bought the trees at the government nursery in Leksono and sells them to the villagers who pay him after the trees begin to bear. It is clearly not himself he is thinking of when he asks 'What does Manggis offer our young people? How long can the land feed them? So far we have managed to make a living off it but what of the next generation? There isn't enough land left. Our sons and daughters will have to leave Manggis to search for work. And they have no training, no qualifications.' What can be done to keep them in Manggis and provide them with a living? He shakes his head in bafflement. 'Things must change. We must subsidise our children's education, send them away to universities and make it a rule that they must come back to the village to work and bring change with them.' Will they? One recalls the detached attitude of the single university graduate standing idle and watching the villagers working on the road: he did not inspire confidence as an agent of change. Then how will it come? 'We must have electricity and running water," says Pak Sardono, turning his sights in other directions. "I am willing to provide some of the money if the government puts up the rest. If we have a clean water supply, and electricity, then . . . '

The future he visualises hangs suspended upon the horizon in the shape of Mount Sindoro's blue cone – visible and within reach and yet remote and detached, now floating like a mirage in the lambent air, now concealed by clouds that rise from the valley.

IV

THE IMPACT OF RECESSION ON CHILDREN

A UNICEF Special Study

Introduction
The Depth of the Recession
The Differing Impact
An Overview
Conclusions for Action

This chapter draws on country case studies prepared for
UNICEF by Roberto Macedo (Brazil), Alejandro Foxley and
Dagmar Raszynski (Chile), Jose Cobas Manriquez, Dr. Jose
Guiterrez Muniz, Jose Camaros Sabian and Rachelle Hartenberg
(Cuba), Reginald H. Green (Africa), Sudipto Mundle (India),
Sang Mok Suh (South Korea), Godfrey Gunatilleke and Kumari
Jayawardene (Sri Lanka) and Dr. Arden Miller (United States).
These country case studies are published in full in the March
1984 issue of World Development (Pergamon Press) and also
issued as a book, The Impact of World Recession on Children,
available from UNICEF.

In addition, the study draws heavily on information and
comments from UNICEF staff and field offices. The report itself
was prepared by a team comprising: Eduardo Bustelo, Giovanni
Andrea Cornia, James Himes, Richard Jolly, Prof. K. N. Raj,
Prof. Hans Singer, Dr. Giorgio Solimano.

Introduction

The world economy is in recession – the deepest, the most sustained and the most widespread since the 1930s. There are glimmers of recovery in the industrial countries, but most serious economic analysts anticipate that rates of growth and levels of economic activity for the rest of the 1980s will remain well below those of the 1960s. As the United Nations *1983 World Economic Survey* put it, recovery is 'plagued with uncertainties' and the 'outlook for most developing countries is bleak'.

In all that has been written about this recession, the pre-occupations have been overwhelmingly and narrowly economic. The analysis has focused on inflation and interest rates, debt and deficits, unemployment and declining incomes. Few who write pursue the human consequences in more than a superficial manner. Even fewer are concerned with what the recession means for the billions of poor in the developing countries. And not a single international study has analysed the recession's impact on the most vulnerable half of the world's population, the children.

This impact is not one that the world can be very proud of. The worst effects of the recession in the industrialized world are being passed on, often multiplied many times over, to the poorest nations, where economic advance has been slowed, halted, or even severely set back. And within these nations, it is the poor, and especially their children, who are the hardest hit. In other words, the weakest members of the human race – young children in poor countries – are the ones left to bear the heaviest burden.

As this chapter documents, this burden has not been spread uniformly even amongst the developing countries. There has been an increasing differentiation in the ways different countries, and different groups within countries, have been affected by the recession.

To a considerable degree, this differentiation has depended upon how countries have chosen to meet the crises, which in turn has determined their adjustments in the social sectors. Many have cut back on social services expenditures; a few have concentrated their resources in one particular area of social welfare at the expense, in part, of other areas, as in Chile; and some, most notably South Korea and Cuba from amongst the group of countries studied by this chapter, have responded by actually accelerating the development of their social services programmes.

All in all, selective evidence from different parts of the world suggests that in most countries significant sections of the nation's children are suffering as one of the consequences of recent economic setbacks. For example, data from Zambia's poorer northern regions indicates that there has been a decline in height-for-age in all age categories up to 15 years old; in Latin America, the number of children treated for severe malnutrition in Costa Rica doubled between 1981–82, while in the state of Sao Paulo in Brazil, there is a pattern of increasing low birth weight babies as well as a significant increase in the number of children given up by their parents because of poverty; even in the United States, infant mortality rates have increased in some areas especially hard hit by recession.

Fortunately, the gravity of the above picture has, to date at least, been moderated by continued improvements in a few areas of child welfare. School enrolments seem generally to have continued to rise, although the quality of education appears to be declining. In some countries, attendance rates at health clinics and hospitals have been maintained, sometimes expanded. And, in most middle income countries analysed in this study, the gradual, long-term decline in infant mortality as expressed in national averages, seems to have continued, until 1982 at least, though usually at a reduced rate.

These points of hope must not be overstated, and in any event they should be balanced by three sobering considerations. First, there is an almost total lack of information about the condition of children in the poorest countries, Africa in particular. This makes it impossible to document the widespread deterioration in nutritional and health status and, possibly, rising infant and child mortality which numerous verbal reports and fragmentary evidence suggest. Second, time lags may be operating between the shock of economic cutback and its consequences for child services and child health. The worst effects of the recession, therefore, may not yet have been fully felt or recorded. Third, while the level of health understanding and the provision of basic social services have generally risen to a point where *temporary* setbacks will not reverse the gains in child mortality rates, the end of the current recession will not, by itself, eliminate the structural problems plaguing the world and national economies which contribute to child and human poverty. For children in impoverished regions, slums, or families, in other words, the end of the recession by itself will not be enough. Restoring momentum to long-term development is vital.

The final section of this chapter therefore identifies priorities for action – of which three are of vital importance, if the economic constraints which hold back many child-focussed actions are to be eased.

1. *International action to end recession.* No matter how discouraging are current prospects, the fact remains that a major measure of economic revival is needed to relax the financial and resource constraints which hold back supportive action in a wide field of child-focussed actions.

2. *A broader approach to the adjustment process.* At present, the process of 'economic adjustment' largely excludes the human dimension, attempting to set the economy right while neglecting the impact on the population. This is an unnecessary extreme – socially, politically, even economically (since it neglects the importance of maintaining investment in human resources). The process of adjustment needs to be broadened by formally recognizing the vital importance of preserving minimum levels of nutrition and household income, and by maintaining basic social services for children and indeed for all the population.

3. In spite of recession several countries have shown that it is possible to embark on a child health revolution, by giving *priority to low-cost, high-effect interventions.* The fact of recession presents a challenge for all countries: how to make the best use of constrained resources. It is this challenge which underlies the economic significance of the priority child interventions so emphasized elsewhere in this report. Because of recession, new opportunities for low-cost action are both possible and even more necessary. They indicate priorities for the plans and programmes of government and non-government groups alike. Giving them this priority, would be a major example of the restructuring process within government expenditure described above.

The failure to take such actions is probably the most serious and tragic aspect of the current response to recession in most parts of the world. In most countries, there seems to have been a systematic sacrifice of the 'social' sectors to the 'economic' in the erroneous belief that social means 'uneconomic.' The fact is that both by hard-headed economic calculations and by the most elementary tenets of human welfare, investment in the health, skills and well-being of children is the most essential investment of all.

The Depth of the Recession

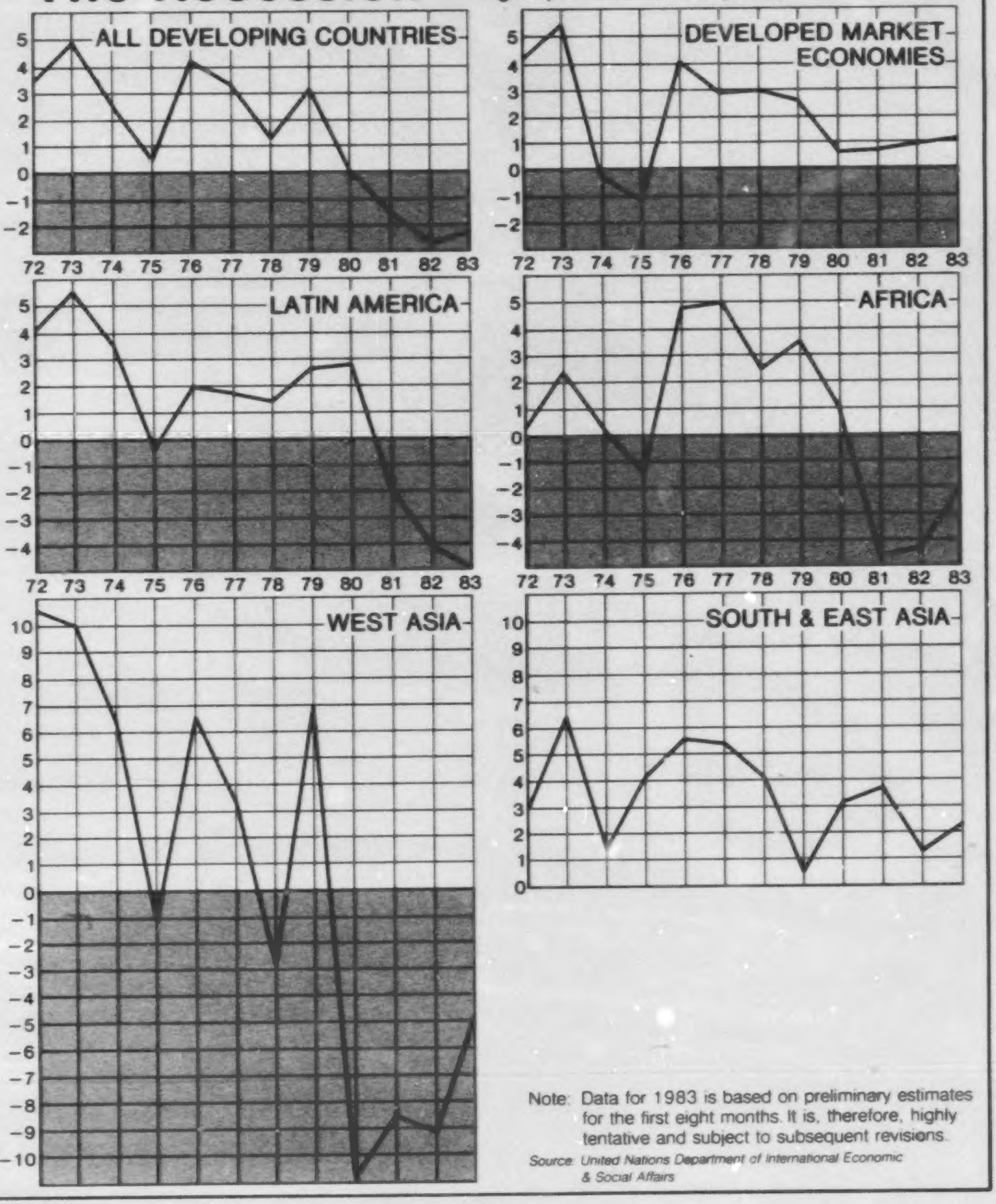
Over the last three years, there have been sharp reductions in the rates of growth of output in almost all the developed economies of the world. Unemployment rates have risen to levels higher than at any time since the Great Depression of the 1930s. Developing countries' economies have contracted in turn, particularly those dependent upon the industrial countries through trade in primary commodities and finance.

Sharp rises in the prices of oil and of grain, lower growth and generally high rates of inflation had already been experienced in the 1970s and imposed considerable hardships on people in almost all countries. Yet except in Africa, the overall rates of growth of output over the 1970s remained high enough in both the developed and developing market economies to prevent actual decline in per capita output and real income.

Table 1:

The Recession

Annual rate of growth of GDP per capita of developed market and developing countries by region (at constant 1980 prices)



Note: Data for 1983 is based on preliminary estimates for the first eight months. It is, therefore, highly tentative and subject to subsequent revisions.

Source: United Nations Department of International Economic & Social Affairs

Moreover, some of the poorer oil exporters (like Indonesia and Nigeria) gained significantly from oil price increases. Others, adversely affected by the oil price hike, avoided retrenchment and decline by securing loans from various sources, particularly the newly industrializing countries such as Brazil and South Korea.

All this has changed in the early 1980s. Not only have rates of growth of output turned negative in many countries (both developed and developing) but the terms of trade have also moved sharply against most of those in the developing world, hitting particularly those dependent on exports of primary products. Countries which had earlier borrowed heavily are now burdened with debt servicing problems on an unprecedented scale, especially on account of higher interest rates and the shorter periods for which the loans are being extended. Many are also constrained by contractionary policies often put in place as part of a package of 'adjustment measures' required to meet the conditions for obtaining balance of payments assistance. What was hitherto seen as only a temporary dislocation has now turned into a crisis of very serious proportions for developing countries and in fact for the entire world economy.

Perhaps another feature which is revealing of the gravity of the present recession has been the widespread loss of employment in the manufacturing sector, mostly urban-based, of many developing countries. Such loss, the first since the early 1960s, has provoked a significant fall in the income of the industrial workforce. The gravity of the situation has been compounded in most developing countries by the sharp decline of imports which have fallen well below the 1980 level. Unlike on the occasion of the previous downturn of the world economy – when several poor countries could maintain their imports and growth through massive borrowing – this has resulted in lower imports of food, drugs and other basic items.

This adverse turn has reduced the rate of growth of output most seriously in Africa and Latin America (including the Caribbean). South Asia and East Asia have been less seriously affected, partly because China and India, the two sub-continental economies, have been much less vulnerable to external pressures exerted through international trade and finance and have continued to grow at about the same rate as earlier. Many countries in East and South-East Asia have also shown greater resilience, partly on account of the stimulus and support received from their close relations with the dynamic Japanese economy.

A disaggregation of the rates of growth of output in developing countries makes clear the widening impact of world recession. In at least 29 countries per capita output appears to have fallen between 1980 and 1982; the number in which per capita *income* has fallen must be presumed to have been still larger. And in most cases the extent of the decline has been very much greater than in the industrialized countries.

Of the countries (other than oil exporters) whose output has fallen over the last few years, about two-thirds are in Africa, mostly those with very low incomes. The rest are mainly middle-income countries in Latin America (including the Caribbean). Only a few economies seem to have been affected so far in Asia, but this assessment might change once the relevant data for countries such as Afghanistan, Bangladesh, Bhutan, Laos, Kampuchea, Nepal and Viet Nam (all belonging to the low-income group) become available.

It is not only countries whose output has fallen that have been adversely affected by the deepening of economic disorder in the world over the last few years. Other countries (such as India and the Philippines) have managed to prevent noticeable declines in the rates of growth of output but have suffered substantial deterioration in terms of trade, particularly on account of the rise in oil prices and continuing upward movement in the price of machinery and other capital equipment. Their national incomes adjusted for the terms of trade have been negatively affected far more than GDP figures would suggest, particularly in 1982. Still others have had to bear rapidly growing debt-service burdens arising from the loans secured to tide over their adjustment problems in the course of the last decade. Lower growth and the adjustments to balance of payments problems have created the prospects of long stagnation in these countries as well as leading to growing unemployment and substantial cuts in various social service programmes, usually with serious reper-

The Linkages:
Multiplying the impact

Even a relatively modest GNP decline in the industrialized countries can have forbidding consequences for poor families in the Third World. This amplification of negative effects is a result of several *'multipliers'*:–

○ A recent estimate suggested that a one percent decline in the rate of growth of GNP of industrialized countries is associated, on average, with a 1.5% decline in the rate of growth of GNP of the developing countries (that is, a multiplier ratio of 1:1.5). If we take the case of developing countries producing primary commodities, the impact may often be greater than this ratio suggests. For instance, it has been estimated that a 0.3 percent drop in U.S. GNP between 1969 and 1970 may have produce[illegible] 12% decline in copper prices. For a country like Zambia, highly dependent on copper exports, this could result in a decline in GNP of about 3% or a 1:10 multiplier vis-a-vis the drop in GNP in the U.S.

○ The impact of the multiplier ratio identified above becomes much larger after adjusting for: (a) the higher population growth rate in the developing world (2.2 percent annually, on average, in 1980) as compared to developed countries (0.8%), and (b) the fact that the population of the developing world group is at least three times larger than for the developed (and that, therefore, any decline in the former affects three times more people).

○ Within a developing country, a drop in GNP often leads on (possibly after some time lag) to a reduction in social expenditures of a much greater order.

○ At the local level, other multipliers may further amplify these negative effects. Indeed, the poorest families in poor countries have to bear a share of the reduction in GNP well in excess of their numbers. It is not uncommon that a 2–3% decline in national income in developing countries results in at least a 10–15% decline in the incomes of the poorest classes. In this case the multiplier ratio is around 1:5.

○ In terms of child welfare, the disproportionate decline in the income of the poorest families is aggravated by the fact that poorer families generally have a larger than average number of children. The child of a poor family may face, therefore, an additional negative multiplier of the magnitude of, say, 1:1.5.

○ Lastly, within the family, as within a nation, a drop in available resources, including food, may be shared in a way which adversely affects the weakest members, i.e., children (particularly girls), the elderly and women.

If we take into account the combined effect of these multipliers, it is easy to see that for a poor child of a large landless family engaged in the plantation or in the export-oriented sector of a low-income country, even a drop of two or three points in the growth rate of GNP of the industrialized nations may easily result in a deterioration of income of 50 percent or more. Even this ratio conveys an incomplete picture of the actual impact, however, since a family losing half of a minimal subsistence level of income is going to be infinitely worse off than another whose income allows for the purchase of non-essentials. For the poorer family, there is little room to manoeuvre, and even a small loss in income can lead to severe health and nutritional problems, even to higher risks of infant and child death.

Fortunately, not all of the rural or urban poor are in such "dependent" situations. The multipliers are not inevitable consequences – nor do all of them operate with the same intensity and in the same direction. *Much depends on social policy priorities and choices.*

cussions on the poorest and most vulnerable sections of society. In short, the momentum of development in the less advanced countries of all shades (including those that were doing well until 1980) has been severely set back. The spectre of a world depression that might, in certain parts of the world last several years, possibly the rest of this decade, can no longer be dismissed as a mere figment of pessimistic imagination.

Causes and consequences

The causes of world economic setback and disorder are many and complex – and, in several key respects, are matters of unresolved controversy. While this is not the place to summarize, let alone analyze, even the basic issues, a few key points must be made in order to clarify the terms used and the broad position taken.

First, the fundamentals are long-term, not short-term. Most serious commentators trace the basic causes to a series of structural imbalances in the world economy, growing increasingly serious since the 1960s. Though weighting and interpretations may differ, the key influences usually include:

○ Growing economic imbalance among the major industrial countries, related especially to widening differences among them in industrial productivity and competitive power. This greatly contributed to the dismantling of the Bretton Woods international economic and financial system in 1971 – and the weakness of most subsequent attempts at international economic coordination.

○ The sharp shocks provided by the large and sudden increases in oil prices in 1973–74 and again in 1979 – causing sizeable foreign exchange deficits and deflationary tendencies in oil importing countries, both developed and developing. Recycling of oil-surpluses in the mid and later 1970s was greater than many at first anticipated, and did help in maintaining the growth momentum of several developing countries. In the 1980–82 period, however, recycling has neither been sufficient nor balanced enough to offset all deflationary tendencies brought about through higher interest rates, rising debt and reduced levels of imports of capital goods, especially for developing countries.

○ The adoption in the U.S. and other major industrial countries of 'monetarist' economic policies, leading to tight restrictions on domestic monetary and credit expansion, especially since 1979–80, and often with severe consequences for public expenditures on health, education and social welfare.

These factors underline the importance of distinguishing three time periods covered by this report. These may be briefly described as:

1. the current recession – covering from about 1979/80 to at least 1983, and for many developing countries, likely to last much longer;
2. the immediate aftermath of the first oil price shock – from 1973/74 to about 1975;
3. increasing structural imbalance in the world economy – from the late 1960s onwards.

Because of the fundamental nature of the basic causes – and the failure of current policy to tackle them – most commentators, internationally and nationally, assess prospects of economic growth over the 1980s in most parts of the world to be substantially below the rates achieved in the 1960s or 1970s. Current economic recovery is likely to be short lived or, if sustained, to be at substantially lower rates than in earlier decades. It is estimated, in Latin America for example, that the rate of growth of per capita GNP will very likely drop in 1983 an additional 5%, with no signs of recovery visible at all for 1984 as yet. To return by 1990 to the 1980 level of real GNP per capita an annual growth rate of over 5% a year between 1985 and 1990 would be required.

The above is clearly not a comprehensive analysis of the crisis. Missing is the long-standing, continuing nature of the structural problems at the international level which hold back development, as do the inequalities of control, access and bargaining power affecting the terms on which developing countries participate in the world economy. To these must be added, at the national level, other structural problems, especially those related to income distribution and land ownership. For example, in the rural areas of many developing countries, insecure and inequitable tenancy agreements and the high degree of land concentration contribute to the continuous growth in the army of underemployed landless labourers. Other national impediments to development often include inequitable distribution of income and the control and consumption of resources by the wealthy few at the expense of the satisfaction of basic needs of the poor.

The Differing Impact

Estimates of GNP and income per capita are nowadays routinely produced for most economies of the world. But because of a lack of comparable statistical attention to the human dimensions of development, there are still wide areas of the world for which there is no reliable information on levels of child nutrition, mortality, morbidity or welfare, let alone up-to-date statistics on how these levels have changed over recent years.

In consequence, any study of the impact of the world recession on children has to adopt a partial and more impressionistic approach. This report uses information from 12 country case studies in an attempt to piece together a picture of how recession has affected different areas of the world. The twelve countries were selected to give a wide geographical distribution and to represent different socio-economic situations, judged by the country's income per head; its trade and financial dependence on the world economy; and its infant mortality rate. A final determining factor was the availability of data.

The countries selected include one least developed country (Tanzania), two highly contrasting low income countries (Sri Lanka, small and trade dependent, India very large and insulated with an important industrial sector), a middle income mineral exporting economy (Zambia), an oil exporter (Nigeria) and two better-off 'newly-industrializing economies' (Brazil and the Republic of Korea). Three middle-income Latin American countries for which recent and reliable data are available are included, each having followed sharply contrasting economic strategies over the last decade: Chile, a strict 'monetarist' and 'free market' strategy; Costa Rica, a more pragmatic and welfare state approach; and Cuba, a socialist development path. A summary of a case study on the United States is also presented showing the results of recession in a major industrial country, along with a brief reference to Italy.

The studies yield a rich diversity of situations which, though incomplete and sometimes perplexing, contain important insights into the contrasting ways in which recession has translated its impact on the lives and welfare of children and their communities.

Africa

By any standard of measurement, Africa – and specifically Sub-Sahara Africa – stands out as a 'Fourth World' continent, its economic and social development lagging far behind the levels attained by other developing regions in the 1960s and 1970s. The combination of the world's highest birth rates and rate of population increase, and the inheritance of acute deficiencies in skills and institutions at independence in the 1960s, has made it difficult for the region to close this gap. Compounding this inequality has been the fact that the impact of the current recession on the region has been far sharper than in the other regions.

Child mortality in the Sub Saharan countries, for example, was 50 percent higher than the average of the less developed countries in the 1950s; now it is almost double the average. The gap in Infant Mortality Rates between all of Africa and the Least Developed Countries was 12 percent in 1950–55, and had widened to 27 percent by 1975–80. In life expectancy as well, the gap between low-income African countries and the less developed countries as a whole widened from 8 years in 1959 to 11 years in 1970 and 12 years in 1979.

Indicators of economic performance tell a similar story. Sub-Saharan Africa's GNP growth per capita in the 1960s was about a third that of all developing countries (1.3% against 3.5%), and fell even further behind in the 1970s (0.8% as against 2.7). This picture of continuing relative deterioration and often absolute deterioration has continued in recent years. Between 1979 and 1980, GNP per capita fell an estimated 2%; 1982 is expected to show a further 2% decline. Responsible for much of this decline has been the continuing deterioration in the region's terms of trade, which since 1978 have fallen by an average of 25%. For countries heavily dependent on agricultural exports, the figure is closer to 40%.

The 'special case' character of the problems of Sub-Sahara Africa is now widely acknowledged, although clearly not all 45 independent states in the region fit this characterisation. Resource-rich countries such as Nigeria (up to 1980), Gabon, Botswana, Cameroon, Angola (but for the war), and Ivory Coast (except for the last few years) present a much more favourable picture; and deep differences in economic policy approaches, as between Kenya and Tanzania or even more profoundly between Kenya and Ethiopia, certainly influence the adjustment process and its effects on different groups, including children.

But in other ways, the impact of the recession on Sub-Sahara Africa, especially since 1980, has been so formidable, and common emergencies such as drought, war, collapse of commodity prices, high interest rates on new credits etc., so overwhelming, that many of the consequences have been shared by virtually all countries. For example, food production per capita between 1979–81 fell in 27 countries of Sub-Sahara Africa, and [illegible] by 1 percent a year or more in only five. The overall decline in food production, averaging about 10%, would have been catastrophic had world cereal prices not simultaneously dipped, reducing the cost of food imports.

The combination of economic and food pressure has led inevitably to reductions in public

Chart 1: Countries studied, ranged by income, dependence on trade and finance, and infant mortality

	High dependence on external trade and finance		Less dependence on external trade and finance	
	High Infant Mortality Rate	Low Infant Mortality Rate	High Infant Mortality Rate	Low Infant Mortality Rate
High Income		Italy		USA
Middle Income	Brazil Nigeria	Chile Costa Rica Republic of Korea Cuba		
Low Income	Zambia Tanzania	Sri Lanka	India	

spending. The effects of such cuts can often be hidden by statistics which show, for example, higher school enrolment and greater use of medical services, but not the rising class sizes, lack of school supplies, poor food and drug shortages in hospitals, inoperative fuel pumps, etc. And while it remains generally true that reduced quality, reduced availability and more difficult access constitute the more directly serious problems during recession, increased user fees for services such as schools and health centres and elimination of programmes such as adult education and literacy classes also play a significant role in curtailing human welfare.

At risk here can be one of the areas in which the continent has fared well, the reduction of inequality between boys and girls in school enrolments. (Girls' enrolments grew from 36% in 1960 to 63% in 1980.) But in the face of increased fees, families may keep their daughters away from school when forced to choose between which children to educate. Given the critical correlation between child welfare and the level of mothers' education, this could have important implications for infant and child health in the long term.

Zambia: A mineral exporter under severe economic pressure

Few African countries have had to make the kinds of economic adjustments that Zambia has been forced to undertake in recent years. It was one of the richest Sub-Sahara African countries after independence in 1964, but a series of continuing, long-term reverses caused by extreme deterioration in its terms of trade now make it an example of how seriously a one-commodity export economy can be hit by recession. A precipitous fall in the international price of copper (which in 1982 reached its lowest price in 50 years in real terms) and escalating costs of oil and other imports, led to a 75% decline in Zambian terms of trade since 1970. This, combined with political and geographical factors such as the liberation wars in southern Africa and the land-locked nature of the country, led to Zambia's incurring in the 1976–81 period a cumulative loss of income equal to over three times the country's 1981 total national income.

These losses have sharply reduced Zambia's capacity to import essential commodities and involved the country in extreme and chronic balance of payment difficulties. Serious shortages of essential goods have developed and arrears in payment for imported commodities make the country extremely vulnerable to periodic threats of being deprived of even the reduced flow of imports. All this makes long-term social planning and deliberate structural adjustment difficult – but doubly necessary. The kinds of policy changes required of Zambia are of an altogether larger magnitude than anything demanded from much richer and better equipped countries and governments.

These international difficulties have often compounded the effect of longstanding domestic economic problems and weakened the country capacity to deal with them. One result was a decline of real GDP per head of 52% in the 1974–80 period. The full blast of the impact was on government capital expenditure, which declined from 1975 to 1979 by 65% in real terms, and by over 75% in per capita; and private consumption declined 21% per head.

The adjustments Zambia has had to make have been painful. Within a shrinking total, social expenditure was disproportionately cut from nearly 30% of total public expenditure in 1972 to about 20% in 1980 – a reminder that basic needs and prosperity are more closely linked than some contemporary debate suggests. Education suffered the bulk of these cuts. Health shares were better maintained and their impact reinforced by a strong emphasis on primary health care.

The government initially protected domestic consumers from the full effects of scarcities, cutbacks and inflation by price controls on some essential commodities, and by subsidizing maize mealie-meal, a staple food for most Zambians. But the control measures could not prevail against the extreme scarcities, and even the mealie-meal subsidy had to be abandoned in 1981.

The retrenchment has taken its toll on children. An ILO Mission provided evidence from the poorer northern parts of the country which were already well below the income level of the rest of Zambia. Its survey from Luapula Province describes extensive shortages in the rural health centres which were unable to replace worn-out bedding, 'driven to improvise dressing from mosquito netting, and unable to control the sharp rise in scabies infection' due to the lack of soap, amongst a myriad of other adversities which have led to most rural health centres being "completely unable to hold more than occasional sub-centre clinics." The number of children's clinics in Northern Province fell from 122 to 86 between 1973 and 1977.

The ILO Mission's review of nutrition surveys, while not entirely conclusive and unambiguous, suggested a significant deterioration in the nutritional standards of children in Northern Province. In height-for-age, for example, there had been a distinct decline for all four age categories, and for mean weight, deterioration in most of them. There also seemed to have been a deterioration in the relative nutritional status of girls up to age ten.

Tanzania: A low income, agricultural economy

'Tanzania is today in the middle of a debilitating economic crisis, one which threatens the living standards and the basic needs fulfilment of much of the Tanzanian nation. Unless some way is found of restoring economic activity to its previous levels and of resuming economic growth, improvements in health, education, sanitation and nutrition will not be possible and even present achievements in these fields may come under severe threat'.

Such were the observations of an ILO report, '*Basic Needs in Danger*,' based on an assessment of the situation in 1981.

The country's crisis may be said to have begun in 1973–74 when serious drought coincided with the first oil shock and inflationary trends in import prices. The balance of payments deficit more than doubled from a tolerable level in 1973 to an insupportable level in 1974. Similarly, the central government's overall budgetary deficit more than doubled in 1975. A loan from the IMF and a short-lived boom in coffee prices in 1976–77 provided some respite, but from then on, the deterioration was traumatic. Between 1977–80, the country's terms of trade deteriorated by over 40%, the volume of exports fell by 9%, and the deficit on current trade increased 3½ times. The coverage of imports by exports dropped from over 70% to 40%. To all this were added the heavy economic burdens of the Uganda war.

The combination of these circumstances, especially the lack of foreign exchange to purchase needed spare parts and raw materials, resulted in plant capacity utilization falling to between 20–30%, and led to serious shortages – indeed often absences – of textiles, blankets and shoes as well as all forms of transport, to mention only some items directly connected with child welfare. The sharp reduction in government revenue also brought under pressure the provision of basic needs services (40–50% of total expenditure), which declined from about 26% of central government expenditure in 1977–78 to under 20% in 1981–82. At the same time, inflationary forces gathered strength, consumer prices rising 30% in 1980, and another 25% in 1981.

Tanzania's outward symptoms might seem to reflect the 'classical' balance of payments problem, but that is not precisely the case. The major economic decisions Tanzania has made have resulted from its firm commitment to the 'African Socialism' expressed by the Arusha Declaration of 1967, which promised egalitarianism, priority for fulfilling the basic needs of the poor, rural emphasis and 'Ujamaa' villagisation.

Relations with the outside world and specifically the response to balance of payments pressures have therefore been strongly affected by the country's desire to reconcile any adjustment measures with the basic development objectives of 'African Socialism'. This tends to be in conflict with the IMF principles of conditionality with their emphasis on a greater role for market forces. The Tanzanian case attracts wide attention as an example of how the social organization of a country with such a specific ideological position can be affected by pressures emanating from a world economy dominated by different socio-economic goals.

Some of these pressures can be seen in the government's adjustment response, including the diminution in the share of central government expenditure devoted to basic needs services. In addition, bogged-down negotiations and suspended disbursements from the IMF and the World Bank in 1982 led to the formulation of a Structural Adjustment Plan necessitating, among other things, the termination of some 200 development projects. At the same time, in an attempt to stimulate further national concern with compensatory social actions needed to protect children from the worst effects of the current recession, the government has set up a task force to draft a National Policy on Child Welfare and Education.

More in keeping with the country's declared goals have been its adjustments in intra-sectoral allocations: within the health sector, for example, the share of rural health services has risen significantly, as facility based, doctor-centred operations have been thinned out in favour of community-oriented, preventive structures more in keeping with both local resources and traditional practices. There has also been a large increase in the number of paramedical staff, paid for in part by cuts in their own real incomes. A mid-1983 survey in the Iringa region (population: 250,000) revealed that the rural health staff numbered 171, as opposed to 112 in 1978; the number of dispensaries had grown to 37, from 32 in 1978; and the number of Mother-Child Health Aides was 21, against only 7 five years earlier. One area registering deterioration was drug availability in government dispensaries, down as a result of import restrictions to 70% of the 1978 level and reducing by 50% the number of vaccinations.

Another noticeable feature of the impact of the recession – and the long drought of the 1979–82 period – has been the tendency for peasants to withdraw from the market and concentrate on subsistence food production. As a consequence the growing urban population – and the urban children – have been affected by the crisis in the form of reduced food supplies, as clearly indicated by the drop in recorded sales in urban areas.

The comparison between two nutritional surveys (covering about 1000 children) carried out in 1978 and 1983 in the Iringa region confirms this trend. Indeed a remarkable decline has been found in the proportion of under-weight (60 to 80% Standard Weight for Age, SWA) and a significant increase in the proportion of children above 80% SWA, with no significant change in the proportion of the severely under-weight children. The same pattern is found for stunting. On the other side, urban children – according to verbal reports – appear to have definitely suffered food shortages.

Nigeria: A middle-income oil exporting economy

Although the oil exporting economies appear at first sight to have gained greatly from the oil price increase of the mid 1970s, Nigerian experience provides compelling evidence that increased economic activity and growth do not on their own lead to significant social gains. For despite the massive oil wealth that poured into Nigeria in the 1970s, it is now clear that many sections of the population, particularly the poorer and more vulnerable groups, did not receive the social benefits that might have been expected to accrue. In fact, as an ILO report, *First Things First*, pointed out, the number of the poor grew and households below the poverty line "increased considerably, perhaps doubling"; inflation rose to 14 percent in the 1970s, well above the average for low and middle income countries, and deeply affected households relying on traditional sources of income; and the proportion of the urban population with access to a piped sewerage system 'has probably been declining.'

Worst of all, because rural development and self-sufficiency in food seemed unnecessary when food could be so easily imported with revenue from oil exports, food production actually declined, and food imports increased an astonishing six-fold, from 389,000 tons in the 1960s to 2.4 million tons by 1979. Declining agricultural production in turn depressed rural incomes, contributing to the accelerated urbanisation process initiated by the oil boom and straining even further hard-pressed urban social services. Urban water supply, under pressure from the heavy influx, broke down frequently, forcing poor households to buy water and reducing their resources for food purchase.

So while the Infant Mortality Rate and Child Mortality Rate fell significantly from earlier high levels, the former decreased no more rapidly with the 1970s oil wealth than it did during the earlier decade. The sudden increase in capital expenditure and big economic projects overwhelmed the administrative capacity available, and drew it away from social programmes, especially the administration-intensive activities in programmes for children. Central government expenditure on all social services was therefore only 18% of the total, compared with about 30% for oil importing Sub-Saharan countries.

The one social indicator which recorded a significant improvement was education. Nigeria was far behind the average of lower middle income countries in enrolment in 1970, but now can boast of virtually full primary enrolment except in the North. Since traditionally the enrolment rate for boys was much higher than for girls this has particularly benefitted girls and will result in higher proportions of educated mothers in the future.

However mixed may have been the fortunes of Nigeria's boom years in the mid-1970s, they were unmistakably reversed in the early 1980s as world recession reduced oil demand, prices and production. Nigeria's GDP fell from $91 billion in 1980 to $70.8 billion in 1981, reducing GNP per head from $1,010 to $870. In spite of heavy international borrowing, imports fell 11% in 1982 and government expenditure in real terms was sharply curtailed in successive 'austerity budgets'. The 1981–5 five year development plan was revised to emphasise consolidation and self-sufficiency. Some indication of the international repercussions, as well as the human tensions of recession, came in early 1983 with the forced exodus of some hundreds of thousands of illegal alien workers and their families.

Asia

Some of the highest rates of economic growth in the world have come from Asia, as have some of the lowest. Several West Asian countries gained from the rise in oil prices through the 1970s; in East and South-East Asia, the dynamism of the Japanese economy, the impetus given by expansion of world trade in manufactures, and rapid internal adjustments, together with fairly high rates of growth of output in agriculture, enabled a number of these countries to achieve exceptionally high rates of economic growth almost throughout the 1970s despite the oil price shock. But on the other hand, most countries in South Asia have suffered from the rise in oil prices and though increased external borrowing has helped to maintain their rates of growth, these rates continue to be low and serious pressures are developing on them on account of their growing external debt.

The economic conditions of the various countries generally have been reflected in the health status of children measured through infant mortality rates. These rates have been brought down to relatively low levels, well below 100 and in some cases even below 30, in most countries of East and South-East Asia with the notable exception of the three countries which have lived through recent war, Kampuchea, Laos and Viet Nam. On the other hand, in South Asia, infant mortality rates still remain at levels well over 100 in most countries (with the notable exception of Sri Lanka). Thus, in this sense, parts of Indo-China and most of South Asia remain the areas where grave problems of child health are still widespread.

All country averages conceal of course wide variations among different regions and sections of society. This is the case even in a small island like Sri Lanka, which has made phenomenal progress in meeting the needs of its people and children over the last three decades. But the variations are very much greater in larger countries such as India, where the latest infant mortality rates vary from levels as low as 39 in Kerala to over 120 in a wide belt extending from Gujarat and Rajasthan in the west, Madhya Pradesh in the centre to Uttar Pradesh (where it is still over 167).

The most serious situation however is in the smaller land-locked countries of South Asia such as Bhutan and Nepal, which have had extremely low rates of growth over the last two decades. In most of these cases, however, the direct impact of the recession and crisis in the world economy has not been very obvious so far, nor is the shock effect of these developments the most immediate danger facing them. Rather it is the possibility, in fact the high probability, that the pressures exerted by world recession may result in the postponement of investment programmes and social welfare policies needed for providing minimum health and educational facilities to the people who live in these relatively inaccessible areas. While attention needs to be given to further improvements in child welfare elsewhere, the much more elementary needs of these people must receive higher priority.

India: A populous, low-income, largely self-sufficient economy

Relatively insulated from fluctuations in the world economy because of its large population (685 million), self-sufficiency, low level of export and import reliance, and heavy dependence upon its own agriculture, India has been able to weather the current recession without any precipitous fall in growth rates or serious deterioration in its terms of trade. Even so, the recession has had a clear impact on the trade and budget deficits (the former rose from U.S. $1 billion in 1977–1978 to nearly U.S. $6 billion by 1980–81) and worsening balance of payments. As explained later, these constraints put heavy pressure on a multitude of social services programmes, and slowed down the expansion of welfare schemes and subsidies which affect children directly.

These setbacks will compound the difficulties that lie in the way of improved health, nutrition and education for India's children. Over the last two decades, the economy has not grown at a rate which could have significantly raised living standards of the majority of the people, especially those in the less developed regions. Regional disparity is in fact one of the country's most pressing problems: as Table 2 shows, per capita output ranges from lows of U.S. $60 per annum for Uttar Pradesh to more than double that for Punjab, Haryana and Maharashtra.

Social indicators reveal even greater disparities. Around 1975–1977, Kerala, the country's most socially developed state, had an Infant Mortality Rate of 52 per thousand, while Uttar Pradesh's rate was well over three times higher (181). The extremes in female literacy are even more striking: Kerala's rate (64%) is almost six times that of Rajasthan (11%).

More disturbing in some regards than the regional differences is the enormous gulf between urban and rural areas, reflected most starkly in Infant Mortality Rate figures: The urban rate fell from 90 per 1,000 in 1970 to 70 in 1978, but the rate for the rural areas, 136 in 1970, was at the same level in 1978 and for most of the years in between was significantly *above* that figure. If we accept the use of Infant Mortality as a key indicator of the status of children, this means that conditions for rural Indian children can be said to have been generally stagnating during this 9-year period, and deteriorating relative to urban improvements.

Regional and other disparities notwithstanding, India has made gradual progress in certain areas of child welfare at the national level. Between 1974 and 1979, the proportion of children with normal weight or who were mildly underweight

Table 2: Infant Mortality Rates, Female Literacy and Output Per Capita in India, selected States[a]

State	Infant Mortality Per 1,000 Births[b]	Female Literacy (Per cent of Population)	State Domestic Product Per Capita[c] (in US dollars)
Kerala	52	64	96
Karnataka	81	28	99
Maharashtra	94	35	139
Punjab	104	34	162
Tamil Nadu	108	34	95
Haryana	113	22	145
Himachal Pradesh	114	31	[illegible]
Andhra Pradesh	123	21	86
Assam	128	—	81
Orissa	141	21	80
Gujarat	146	32	118
Rajasthan	146	11	[illegible]
Madhya Pradesh	146	16	76
Uttar Pradesh	181	14	60

[a] *Data for Bihar, West Bengal and other territories are not reported because of the limited reliability of available information.*

[b] *For 1975–1977 period*

[c] *For 1975–1976*

Sources: (i) *Sample Registration Bulletin, various issues* (ii) *Census of India (1981)*; (iii) *Pocket Book of Health Statistics*;

grew in six out of the ten states surveyed, as well as nationally; the same is true of height-for-age increases; and trends in infant mortality and life expectancy at birth, to the extent that they can be so used, also indicate that the living standards of India's urban child population have been improving through the 1970s.

The most encouraging results have been in the field of education, especially female literacy and school attendance. The enormous gap that separated the two sexes has been closing as can be seen in school enrolment figures from the urban areas, where 83% of boys and girls in the 6–11 year age group are enrolled in school in almost equal proportions. This has had a dynamic affect on female literacy rates: while there was only one woman in every 15 literate persons at the turn of the century, the ratio has declined five fold, with one out of every three literate persons in 1981 a woman.

To what does one attribute these successes, however modest? The table reveals again the conventional correlation between social gains and economic well-being, but the exceptions are in a sense more intriguing than the rule. Kerala is well recognized as an important exception, but other examples abound: the Punjab, for instance, despite a high per capita output ($162) nevertheless had an Infant Mortality Rate of 104. In the same vein, Kerala provides almost one hospital bed per thousand of its people with a per capita output of $96 p.a., while Haryana has managed only half a bed despite a substantially higher figure ($145). Quite clearly, child and family well-being can be heavily affected by public policy, and are not functions of economic conditions alone.

The improvements India has recorded in some areas of child welfare cannot always be regarded as unambiguous achievements, since they are often being measured against living conditions originally of extreme deprivation. For example, the number of children in child labour increased by about 65% between 1965 and 1975, even though the total number of adult labourers actually decreased. Between 50 to 60% of Indian children suffer from inadequate calorie intake, and around 10–20% from additional protein deficiency. India's Infant Mortality Rate is still among the highest for countries with populations of over 100 million. The gravity of the situation becomes clearer when one considers that in a number of states, conditions for children were actually deteriorating even before recession-induced deficits began to affect the delivery of social services.

The world recession came at a critical time for India's poor, especially children. Balance of payments and budgetary constraints forced the government to curtail or slow down the expansion of investments in child-related services from 15% of total expenditure in the Fourth Five Year Plan (1971–1975) to 12% in the Fifth Plan (1976–80) and further to about 10 percent during the Sixth, although, because of the rapidly growing total plan outlay, the expenditure on these services has grown in real terms. Continuation of the recession is going to make it even more difficult for the country to find the resources necessary for the increased social investments so urgently needed to enhance child welfare.

Sri Lanka – A low-income primary commodity exporter with low Infant Mortality Rate

Sri Lanka's renowned social policies – which brought its people social gains that most countries with twice its per capita income have not come close to matching – have helped the nation meet critical economic challenges posed by the world recession. This, in turn, has motivated the country to make a serious effort to maintain its social expenditures despite demands that resources be shifted to investment in physical capital.

During the 1970s, Sri Lanka's economic problems centered around its deteriorating terms of trade. Heavily dependent on its trading relations with the rest of the world, the country was affected by the failure of the price of tea, its main export, to keep pace with the rising costs of its imports. In addition, its two other export crops, rubber and coconut, being sensitive to business cycles in the industrial economies, were not a steady source of revenue. The result was a low rate of growth, rising unemployment and widespread food shortages. The first energy crisis of 1974 dramatically aggravated the situation, with the sudden increase in the price of food causing virtual famine conditions and making the infant

Stagnation:
The case of Bihar

As mentioned in the India case study, the diversity of situations in India is so startling that use of national averages disguises divergent trends and situations. The study, for example, does not substantiate any general deterioration in the chronically critical conditions of vast numbers of Indian children, and even points to some modest nutritional gains. But in certain poverty-stricken areas, the condition of many children has stagnated or even declined.

○ Bihar's Kosi region is a case in point. It is in many ways peripheral to the world's – and even India's – overall economic development. Improvements and deteriorations are largely the result of structural factors and local changes. In one respect, however, it is unusually close to the world market, through trade in jute; but much of the gain from this trade benefits interests outside the region.

○ A recent ILO study compared the employment opportunities, wages and living conditions of the families of landless labourers in seven Kosi villages in North-East Bihar for 1970–71 and 1981. Although limited in coverage the study is very useful as most of the households surveyed in 1971 were located again in 1981, thus allowing comparison between the two periods.

○ Strong conclusions between cannot be drawn from such a small sample of households. However, to the extent that the data describe the evolving situation of one group of the rural poor, the picture is not encouraging. The hopes of the 1960s for growth have not yet materialised. Expansion of irrigation in the 1970s, while rapid, still only covers a small fraction of the irrigable area. Small pockets of high-productivity 'capitalist agriculture' have developed, but the semi-feudal mode of production which dominates the area has proved resistant to change.

○ The outcome has been stagnation. Real incomes, which in 1970–71 were insufficient to meet calorie recommendations even if devoted exclusively to cereals and pulses, have changed little. The patterns of access to land and jobs are still much the same, as are levels of fertility. Literacy rates for the whole area have increased over the ten years by only 4 points – from 15 to 19% – and probably stagnated among the landless labourers. Female literacy in the area is still below 10%, one of the lowest for any part of the world. Child labour remains common.

○ In other respects the situation seems to have worsened. The quality of the diet has deteriorated; the real wage has declined; overall and infant mortality levels, high in any case (infant mortality among the children of labourers is estimated at over 300 per 1,000) seem to have risen in the 1970s, especially among girls.

○ The basic problem is not lack of employment but the low level of real wages. Average employment levels are fairly high, and young people are if anything overemployed, especially boys, who are usually in full-time work by the age of 10 or 12, often younger. Access to land is one possible solution but substantial land redistribution would be required to change the situation in any meaningful way. Direct government action to improve wages seems unlikely to succeed as there is little or no organisation of labour, and wage-fixing is mainly controlled by a few larger landlords.

○ A second problem is vulnerability. The households analysed had no independent mechanisms to resist crisis. Households with few dependents can often generate acceptable incomes, but households with young children, elderly dependents, and high proportions of females are severely disadvantaged. Such situations greatly increase the power of those with sufficient resources – landlords, merchants and upper peasants – to resist crisis, but often at the expense of the rest of the population.

mortality rate rise 5 points in that year, from 46 to 51 per thousand births.

Dissatisfaction with the situation led to major political and economic changes. These included devaluation, import liberalization, removal of price controls and food subsidies, and freedom of capital movements. The international economy responded positively to the country's new posture as an open economy guided in the main by market forces, and there was an unprecedented expansion in the inflow of foreign resources. Foreign investment per year, which was negative in 1975, rose to $47 million in 1979 and to $54 million in 1982. Other private long-term capital, negligible in 1975, grew to $216 million in 1982, in which year the balance of payments account reflected a healthy surplus of $267 million, up from $95 million in 1975.

Sri Lanka was able, therefore, to mount a massive investment programme in the late 1970s thanks in part to the population's high levels of literacy and labour force skills achieved through its commitments to the social sectors. The country's real GNP in the 1978–82 period grew at more than twice the rate (6%) of the 1970–77 period (2.9%). In the process, Sri Lanka was able to reduce its external dependence on both food imports – which in 1982 accounted for only about 13% of all imports as against 48% in 1975 – and exports of tea, rubber and coconut, which declined from approximately 76% of the export total in 1975 to about 47% in 1982.

This quickened economic growth enabled the country to avoid the cutbacks characterising most other non-oil exporting economies, and the earlier favorable trends in the social indicators, particularly relating to health and literacy, have continued. The overall adult literacy rate has risen from 78% in 1973 to over 86% in 1980–81; infant mortality has fallen during this period from 46 to a little over 38; and life expectancy has risen from 66 to 72 years.

Not all social indicators were positive, however. Income distribution, while improved over the 1973–77 period, sharply deteriorated between 1977–80 and, possibly in the following years. In addition, the conditions in the poorest households improved only marginally, possibly accounting for the increase in child labour on the island. And while most categories of death rates continued to fall, the Infant Mortality Rate between 1978 and 1979 did not. Whether this crucial indicator of child welfare – and one of which Sri Lanka has justifiably been proud – has suffered only a temporary setback is not yet clear.

Sri Lanka's success story has another distressing lapse: the community most direly in need of increased social services – those working in the plantation sector – has been unable to receive them. The plantation's labour force, constituted in the main of what are two cheap sources of labour, women and children between 14 and 16 years of age, lacks adequate supply of safe drinking water, proper housing and toilet facilities, and is less educated and therefore less aware of the minimum requirements for health. Consequently, there have been marked differentials between the infant and maternal mortality rates between this sector and the rest of the economy. In 1920, the infant mortality rate on plantations was 224 (per 1000 births) while it was 182 in the island as a whole; though it has gone down sharply in the island since then, infant mortality in the estates appears to have remained at a level between 95 and 115 during the last quarter of a century, showing even a tendency to rise in the first half of the 1970s compared to the levels reached in the 1960s.

The basic cause of high mortality and debility of infants on estates is the severe and increasing malnutrition among mothers. Doctors working in the plantations have frequently commented on anemia among estate women; other factors are the lack of hospital facilities, trained midwives and ante-natal care. The gravity of the problem emerges grimly whenever there is an exceptional famine situation, for in such an event the first to be affected are children and mothers. The sudden price increases for foodstuffs linked to the 1974 energy crisis had a particularly devastating effect on the children of the plantation areas (which do not grow food): the infant mortality rate, 103 in 1973, soared to 163 within a year.

The current recession has also taken a further toll. One plantation area for which figures are available, Haputale, shows that between 1979 and

1982, infant mortality rates increased from 58 to 71. Since an increase in relatively low Infant Mortality Rates is usually a consequence of serious economic deterioration, this undoubtedly reflects hardships in other spheres as well.

Republic of Korea: A fast-growing Newly Industrializing Country

In the 1963–78 period, the Korean economy recorded one of the world's most remarkable performances, growing at a rate of 9.9% per annum in real terms. This growth was based on rapid industrialization, led by the export and manufacturing sectors, whose outputs increased at average rates of 40% and 19% per annum respectively. Unemployment fell from an average of about 8% in 1960–62 to 3.6% in 1976–78.

But this rapid growth created bottlenecks in the economy and led to an inflationary surge which sharply curtailed the competitiveness of Korean export goods, and the economy suffered its first major setback in a decade and a half, with the Gross National Product actually declining by over 6% in 1980. Per capita real income fell between 1979–81 by 10%, and agricultural output dropped 22% in 1980, causing increases in wholesale food prices to rise from 12% in 1978 to 39% in 1980. The worsening economic situation was compounded by the second oil price increase in 1979, raising Korea's petroleum import bill from 2.3 billion U.S. dollars in 1978 to 5.8 billion U.S. dollars in 1980. The country had adjusted to the 1974 oil price rise by a rapid increase in export volume, but in 1980 high internal inflation as well as the higher protective barriers in recession-hit external markets rendered similar adjustment measures unfeasible.

In response to depressed international markets, the government's attempts at economic revival focused on domestic demand and growth. Tax incentives were offered to encourage private housing construction, greater public investments were made in areas of high employment creation, and monetary policy was relaxed. The strategy met with immediate success and the economy rebounded: in 1982, unemployment declined, GNP grew by 5.4%, average household income rose, and wholesale price increases were limited to 2.4%. The improvements continued into 1983, with the first quarter recording a GNP 9% higher than the same quarter of the previous year.

The government also shifted from its heavy emphasis on growth to take into account growing social needs. During 1976–78, the proportion of government expenditure in the social welfare field (excluding education) was only 7%, well below the level for other countries with the Republic of Korea's per capita income. But this was speedily increased by 35% per annum between 1978 and 1982, and public social welfare expenditures increased from 22% of total government outlays to 27% in the same period. A major part of this increase went to the health sector as the government initiated medical insurance coverage for wage and salary earners, as well as free medical services to those in the lowest income groups. Between 1977 and 1982, public expenditures on these medical assistance programmes grew from about 10 million U.S. dollars in 1977 to over 40 million U.S. dollars in 1982. Following upon these efforts, the budget allocation for mother and child health care expenditures increased twelvefold (in national currency) in just two years, from 1.6 million U.S. dollars in 1980 to over 15 million U.S. dollars in 1982.

These new allocations to social services programmes helped preserve and continue the steady improvement in child welfare earlier achieved through speedy economic growth. The number of those living in absolute poverty, and therefore most dependent on the state for the provision of social services, declined from about 40% of the population in 1965 to only about 10% in 1980. Infant Mortality Rates dropped from 53 per 1,000 births in 1970 to 39 in 1978 and 36 in 1981; the morbidity rate of two of the most serious communicable diseases, Typhoid and Diphtheria, decreased from 13.1 and 3.4 in 1965 to a mere 0.4 and 0.1 respectively in 1981.

These achievements notwithstanding, pockets of the Korean population still suffer deprivations. The rapid urbanization has led to a proliferation of urban squatter areas where the intake by preschool children of calories and all major nutrients is below determined requirements. The heights and weights of these children are also generally much lower than the country's averages. Poverty, which in the pre-1965 period was mainly a rural phenomenon, is now increasingly seen as an essentially urban problem, and it is this area that the country needs to focus on in its delivery of social services. The more basic general problem was an increasing trend toward income inequality (although still low compared with many other countries.)

Latin America

After a long period of extraordinary economic growth in the post-war period, most countries of Latin America are experiencing severe economic dislocations in the current crisis. Estimates from the Economic Commission for Latin America show that for the first time in four decades, the region's gross national product, having grown at the rate of over 5% a year since the war, may actually have fallen in 1982. Income per capita, in real terms which rose from $780 in 1960 to $1400 in 1980, has been declining for two consecutive years, and the decrease in 1982 appears to have exceeded 3%.

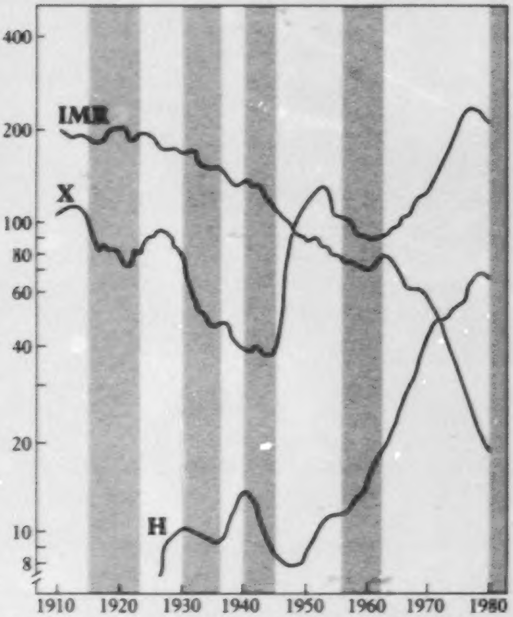
The earlier growth, however spectacular, had been accompanied by heightening income inequality – and, sometimes, poverty – through the last two decades, unlike some Asian countries where rapid growth was combined with greater equality. The share of the household income of the poorest 40% of all families, which was 8.7% in 1960, had fallen still further, to 7.7% by 1975, while the richest 10% had increased their share slightly to virtually half of the continent's income. The problem of unequal income distribution is more serious in Latin American countries than in the other major regions of the world, and combined with a demographic profile in which children predominate – over 40% of the population is under 14, compared with 24% for Europe – has meant that an unusually heavy burden of poverty is being borne by children and youth.

The problem of income distribution in Latin America can also be seen in terms of sharp regional disparities. The largest concentration of poverty in the Western Hemisphere is in the Northeast of Brazil, with other significant numbers of very poor people living in the Andean highlands, the poorer countries of Central America, and parts of the Caribbean, especially Haiti. In total, the absolute poor in the region number at least 100 million, and some estimates suggest that the number may be closer to 150 million, out of an estimated total population (mid-1982) of 378 million. Whatever the appropriate figure, almost half of the very poor are infants and children.

The world recession of 1975–1976 slowed down but did not halt the general trend of the fairly rapid growth prevailing in Latin America and the Caribbean, with the important exceptions of Argentina, Bolivia, Peru and Venezuela. But the latest recession has made itself felt sharply throughout the region. Brazil, the region's largest economy, which – despite the sharply increasing cost of energy – continued to follow a policy of rapid industrialization and a judicious mix of import substitution and export promotion is faced with massive external and internal indebtedness. It also had an unusually steep drop in per capita income in 1981 (4.2%) followed by a decline of 1.8% in 1982. Chile, which responded to the earlier recession by instituting strict monetarist policies and enjoyed a boom during 1977–80, saw its per capita GNP fall by over 15% in 1982. Argentina and Uruguay, following a similar economic model, also performed poorly in recent years. The overall regional decline has particularly set back those groups which were already experiencing the earlier social consequences of most countries' policies in the form of increased unemployment, deteriorated income distribution and continuing inflation. This combination of setbacks has had an especially adverse consequence on children because of the relatively high dependency ratio in Latin America and the Caribbean (2.2 dependents for each worker as opposed to 1.1 in the industrialized countries).

In spite of considerable differences within the region regarding adjustment policies, a common phenomenon since 1976 has been increasing external indebtedness. In the mid-1970s, relatively 'soft' money was easy to obtain, sometimes even with negative interest rates. Later, especially following 1980, the Latin American and Caribbean countries had to pay substantially higher margins on top of already high real rates of interest. As a consequence, the debt service

Chart 2: Relationship between infant mortality rate and economic conditions, Costa Rica 1911–1981



Source: Luis Bixy, 'Social and Economic Policies and their Effects on Mortality: The Costa Rican Case', INED, Paris, 28 February – 4 March 1983

Annual decline in infant mortality rate, periods of economic crisis and other periods, Costa Rica, 1911–1981

Infant mortality decline 1 year of lag	
Periods	Mean of annual decline (percent)
1911–1914	1.9
1915–1923	−1.9
1924–1929	3.7
1930–1936	0.5
1937–1939	1.7
1940–1945	2.9
1946–1955	3.1
1956–1963	−2.6
1964–1980	8.5
1981-	—
Total (1911–1981)	2.8
Years of crisis	−0.5
No crisis	5.2
Differences	5.7

Note: The minus sign indicates a worsening infant mortality.

IMR = Infant mortality rate per 1000 live births

X = Exports per capita, in 1970 U.S. dollars

H = Expenditures on public health, per capita, in 1970 U.S. dollars

▨ = Periods of economic crisis

burden facing the region is of an extraordinary dimension. According to the Inter-American Development Bank, for the period 1976–1980, the mere servicing of Latin America's external debt accounted for 47% of regional exports. In the case of Brazil, this ratio reached an unprecedented 97% for 1982. The total external debt for the region, public and private, now exceeds $300 billion—a figure which exceeds the gross domestic product of any country in the region.

Impact on children and poor families

Is there any evidence that the two major economic recessions of the last ten years have had measurable effects on the health, education or well-being of children in Latin America and the Caribbean?

If one uses the infant mortality rate as a measure of children's well-being, it would appear not. Whatever else can be said for the infant mortality rate as a social indicator, this measure of child welfare is apparently not especially sensitive to the kinds of economic difficulties which the Latin American countries have faced in recent years. In each of the four countries which were reviewed in connection with this study (Brazil, a large, middle-income, fast-growing newly industrializing country faced with a large external debt; Chile, a high middle-income open economy experiencing a severe economic downturn; Costa Rica, a middle-income social welfare state; and Cuba, a small middle-income socialist country implementing child protective policies) well established tendencies for steady infant mortality rate decline do not seem to have been affected by the adverse economic conditions of the past few years. But infant mortality rate data covering earlier periods of economic recession do indicate some reverses in infant mortality rates. Such was the case, for example, in Chile in several years of the decade of the 1950s and early 1960s, in several states of Brazil from the mid-1960s to the early 1970s, in Cuba during 1968–69 and in Costa Rica in 1956–1963. To some extent, these increases appear to be related to deteriorated economic conditions.

One of the most complete studies of how the infant mortality rate relates to economic cycles was done by Luis Rosero for Costa Rica for the years 1911–1980 (see Chart 2). Examining the periods of economic recession (1915–1923, 1930–1936, 1940–1945, and 1956–1963), this study indicated that in normal times the annual decline in the infant mortality rate averaged 5.2 percent. In the years of economic recession, allowing for a time lag of one year, the infant mortality rate actually rose slightly, at a rate of 0.5% per year.

It appears that the association between economic conditions and infant mortality rate is closer, at least in this region, when the infant mortality rate is high. During the period 1956–63, which was associated with an increase with the infant mortality rate in Costa Rica, the infant mortality rate was in the range of 85. In Chile during the 1950s, the infant mortality rate was above 100. With the infant mortality rate for Chile, Costa Rica and Cuba now having fallen to below 30, no close association between infant mortality rate and short-term changes of economic conditions can be readily discerned. However, because of the severity of the economic crisis currently confronted by Costa Rica, and perhaps Chile, it will be important to monitor infant mortality in these countries with special care during the next several years.

In general, it appears that infant mortality rates in most Latin American countries have reached a point where continued, though perhaps more modest, gains can be expected in spite of adverse economic conditions. Certainly countries such as Chile, Costa Rica and Cuba, plus the relatively advanced states in Brazil such as Sao Paulo, have developed a degree of public health infrastructure, levels of mothers' education, and sufficient access to modern health technology, to assure that most infants born in high risk categories will survive at least during the first year of life. As in the more industrialized countries, the challenge for the future in terms of infant mortality in many Latin American countries relates to the need to protect especially vulnerable groups which have been left behind as more general economic progress has taken place. The most dramatic example of 'those left behind' is the large population of the Brazilian Northeast, where the infant mortality rate in a number of areas remains above 150.

Another troublesome statistic, from recent public health data for the state of Sao Paulo, relates to low birth weight babies, i.e., infants born with a weight of less than 2,500 grams. Although it might be premature to relate these findings to the current recession in Brazil, there does appear to be a clear pattern of increasing rates of low birth weight babies over the period 1979–82 for the state of Sao Paulo, and most likely for the city as well. Unfortunately, very few countries in Latin America monitor the incidence of low birth weight babies on a regular and systematic basis. Since this indicator is often the single best predictor of infant mortality, a special effort would appear to be in order to improve procedures for such monitoring.

The measures taken by Latin American governments to prevent an increase in infant and young child mortality during times of economic recession have perhaps been sometimes too sharply targeted, at the expense of continued progress in other areas of public health and social welfare which are also important for children. In Chile, for example, a deliberate policy of the current Government of concentrating human and other resources on the care of pregnant women and recently-born children seems to have been implemented in part by sharp reductions in capital investment and the acquisition of basic supplies for the health sector. Although this has helped maintain the reduction in infant mortality, it appears to have gone along with an increase in child poverty and malnutrition.

In Brazil, there has been in the state of Sao Paulo in the past few years a quite significant decline in capital expenditures for education and health. In Cuba, some of the commendable progress which has been made in the area of maternal and child health and education may have been at the expense of continued progress in other areas, such as low-income housing and rural water and sanitation, which are areas of continued deficit in an otherwise quite positive picture of social progress relating to the welfare of children. In Costa Rica, reductions in social expenditures led to a 20% fall in the number of beneficiaries of school lunch and other supplementary feeding programmes between 1979 and 1982, and the number of Costa Rican children treated for severe malnutrition in the country's principal recuperation centre doubled between 1981 and 1982. That infant mortality continued to decline in both 1981 and 1982 in spite of these cutbacks shows the success of their programmes – but the other developments are clear indications of the increasingly uncertain foundation on which the progress rests.

In Chile, although food supplementation for pregnant and lactating mothers and for children under 5 has been increased in recent years, support for school feeding programmes has been sharply curtailed. As a consequence, it appears that malnutrition among school children from low-income families may be more serious than it is among pre-school children from similarly low socio-economic backgrounds. There has also been a significant increase in recent years in the number of children treated for malnutrition in Chile's recuperation centres of 'last resort'.

There are also disturbing indications that one result of the recent economic crisis in several Latin American countries may have been a substantial increase in the number of abandoned children. Statistics on subjects such as child abandonment and abuse are always elusive. Data from Costa Rica, however, shows a more than threefold increase in officially recorded cases of abandoned children between 1980 and 1982, and a serious increase in cases of drug addiction and apprehension of vagrant children. In Brazil, there was a significant increase in Sao Paulo state in the number of children given up by their parents because of poverty as well as in the numbers reported to have been taken into custody by FEBEM, the principal state agency concerned with the problems of young children.

One area of considerable importance for child health where Latin American countries apparently have made a special effort to maintain or increase their commitment, in spite of recession, is in immunization against the principal childhood diseases. Data for 1980–82 for Brazil (Sao Paulo state), Chile and Cuba indicate increased rates of immunization, as well as progress in reducing the mortality rates of diseases such as diarrhoea which are less easy to treat. But there is some evidence to indicate that economic recession may be complicating efforts to deal with causes of death which are less easy to treat. For example, in Sao Paulo state a significant reduction in the proportion of deaths in the 1–4 age group due to enteritis (producing diarrhoea) has been accompanied by a gradual but possibly significant increase in the same age group in the proportion of deaths associated with malnutrition.

Another noteworthy example of a strongly 'child-protective' response to difficult economic conditions was the decision of the Cuban Government to maintain in 1982 its expenditures on education and health in spite of a 13% reduction in the public sector budget. This decision was taken in the face of a necessary reduction of 44% in support of Cuba's state enterprises. This review did not encounter evidence of any deterioration in the health or educational status of Cuban children during these recent years of world economic recession.

These are not achievements, however, which give cause for any enduring satisfaction. The capital allocated to the protection of children is already coming under pressure from other investment demands. The demands give every indication of intensifying as the recession deepens and shrinks further the pool of resources available for national development. Recession, morever, often has an adverse psychological consequence of inhibiting the initiation of new programmes in education, health and social welfare even if these programmes are likely to be more cost-effective than existing approaches. It must not be forgotten, furthermore, than even in "better times," the majority of Latin American children continue to live in poverty.

Industrialized countries

It has long been assumed that the extensive 'capital stock' of social infrastructure built up over many decades in the rich industrialized world will prevent any serious slide back into poverty for those who have struggled out of it. Cushioning this 'capital' – and the above assumption – has been the rapid expansion of social welfare programmes in the post-war period, as well as the experience of the last forty years during which downturns in economic activity did not lead to any significant impairment of the gains made by and on behalf of children. On the surface, even this recession seems not to have affected the most basic indicator of the well-being of children, the infant and child mortality rate, which, at the level of national averages, continues to fall. So great is the wealth of industrialized nations that whatever potential threat might be posed by recessions to social programmes arises less from a shortage of resources than from a shift in spending priorities.

But data are emerging which should make us question this assumption. The most disturbing is the increase in infant mortality rates in a number of states and localities in the U.S. which were especially hard hit by the 1981–1982 recession. These areas include the state of Alabama, Flint and Pontiac counties in Michigan, Central and East Harlem in New York City, as well as 34 other cities in the U.S. Reports from Michigan and other states also suggest an increase in low birth weight babies during the recent recession. Precise identification of the causes of this deterioration is not easy, but preliminary studies have so far been able to document and relate it to a significant decline in pre-natal care for 'high risk' women who have become victims both of economic recession and shifts in spending priorities.

The United States is not alone amongst the industrialised countries to have experienced setbacks for its children. Infant mortality rates in the Soviet Union are reported to have risen sharply in the 1970s; and in Italy, where greatly expanded social welfare measures helped moderate the worst effects of high inflation and high unemployment since the mid-1970s, the rate of decline of infant and neo-natal mortality has nevertheless been slowed.

The current recession is only the latest of several setbacks over the 1970s, and the consequences for children have been gradually appearing in social and economic indicators since then. For example, the 'children's poverty rate' in the U.S., i.e. the proportion of children under 18 living below the officially-established poverty line, fell steadily throughout the 1960's. In the 1970s, no clear trend was evident until the 1974–75 recession, when it began a steady increase. The increase appears to have been especially sharp since 1981, and about one out of every five children in the country now lives in a household at or below the poverty level. The proportion, of course, is much higher for disadvantaged minorities.

One factor responsible for this is the greater prevalence of households headed by women. The proportion of children living without parents or in a single parent household increased steadily from 9% in 1960, to 13% in 1970, and to 21 percent in 1981. Roughly 90% of children in single parent households live with their mothers, and over half of these households were under the poverty level in 1981. According to a 1978 survey, children in female-headed families are roughly six times as likely to be living below the poverty level as children in families headed by men.

Another reason why such a high and increasing proportion of children live in poverty households relates to unemployment. Unemployment among low-income families, especially when prolonged, has a devastating effect on family income and welfare as unemployment compensation and benefits are exhausted. The impact of unemployment on health is especially serious in the U.S. because of the country's heavy reliance on private health insurance schemes, many of which are linked to employment. It has been estimated that health insurance is lost by 80% of unemployed families in the U.S., and that there are roughly 25 million people (i.e. the unemployed plus their dependents) in the country who lack health insurance because of unemployment.

In spite of the increasing proportion of children living in poverty after 1975, most measures of health status and the health and other risks for children show steady improvements throughout the 1970s, even during the serious recession of 1974–75, which was just as prolonged and produced unemployment rates that rivaled those of 1981–82. One of the explanations for this improvement lies in the fact that throughout the 1970s the exercise of public responsibility for financing and providing essential services and supports held constant or improved. Increases in health benefits were especially striking during the 1974–75 recession.

These circumstances suggest that public supports and services had a cushioning effect that mitigated the adversities of unemployment and impoverishment, protecting children from the worst effects of a serious temporary recession and of increasing poverty. This cushioning effect, important as it was, did not, however, cover the full scope of children's needs. It did not, for example, hold down rising suicide rates among young adults, and it did not prevent a decline in immunization rates for key childhood diseases. Nor was it able to close the wide gap that separates social well-being of white and minority children. The Infant Mortality Rate, for instance, dropped by almost half for both groups between 1960 and 1978 – but it was 12 per 1,000 for whites, and almost double, 21, for blacks and other minorities. The question of minority children and the slow pace at which economic and social benefits are directed to them should clearly be a matter of special concern.

More needs to be known about the health status and risks for U.S. children in the last three years, since existing data systems do not report human statistics in a speedy manner. Sufficient information is available nevertheless for concerned policy makers to conclude that the health of children, pregnant women and poor families is suffering and may be jeopardized for years to come. Recorded increases in child abuse, growth stunting among poor children, the growing prevalence of entire families at free food distribution centres, and increased rates of tuberculosis among the poor should alert all of us to the perils that children face during difficult economic times, even in a country as wealthy as the United States.

An Overview

How can one summarize the ways children and child services have been affected as the downturn and cutbacks of recession have spread their way across the world? As the case studies have shown, this is a complex question to which there is no simple answer. In this regard, chart 3 presents an analytical framework which illustrates the effects on child welfare of the current economic recession. This framework has some obvious limitations. It is highly simplified and does not, for reasons of brevity, differentiate the impact of the crisis by countries with different socio-economic characteristics. Furthermore, it does not separate the influence of long-term trends from that of short-term fluctuations.

It is helpful to give perspective to this overview by emphasizing three dominant types of influences on child welfare. The first is the set of *family and community circumstances* determining the physical, social, cultural and psychological environment in which the child lives. A clean environment and solidarity among the members of the family and the community, for instance, certainly have a major influence on child survival and welfare. At the family level, parents' education (the mother's in particular) has a most important influence on child welfare. Parents' education enhances – through better knowledge of child feeding, caring and rearing practices – the proper utilization of the economic resources existing within the household or the community.

The second major influence on children's well-being is *household income*, overwhelmingly so for poor families. Wage income from employment or agricultural production for sale or use is obviously necessary for the satisfaction of a child's needs, particularly in the area of nutrition, clothing and housing. In some countries, family income must also be used to a significant part to provide for children's health and education. A decline in employment, agricultural output or prices will reduce such income, resulting in a deterioration of family and child welfare for low-income households, particularly when the fall is sharp and sudden. Indeed the possibilities for adjustment at the family level (shifting consumption patterns, migrating, etc.) are greater when changes take place gradually.

A third kind of influence is represented by *government expenditure* on social services. Resources for such services are generally raised through tax revenues, which can dip dramatically in the presence of sharp falls in production, trade and consumption. Reductions in expenditure are then unavoidable, but what types of public expenditure are cut (armaments, health, food subsidies, etc.) is a matter of choice. Clearly, how serious the consequences are for social equity and child welfare depends on the nature of the choices made.

How children are affected

The country case studies provide four ways to measure children's status, each with different implications for child welfare and with different time lags.

Effects on incomes and resources for children

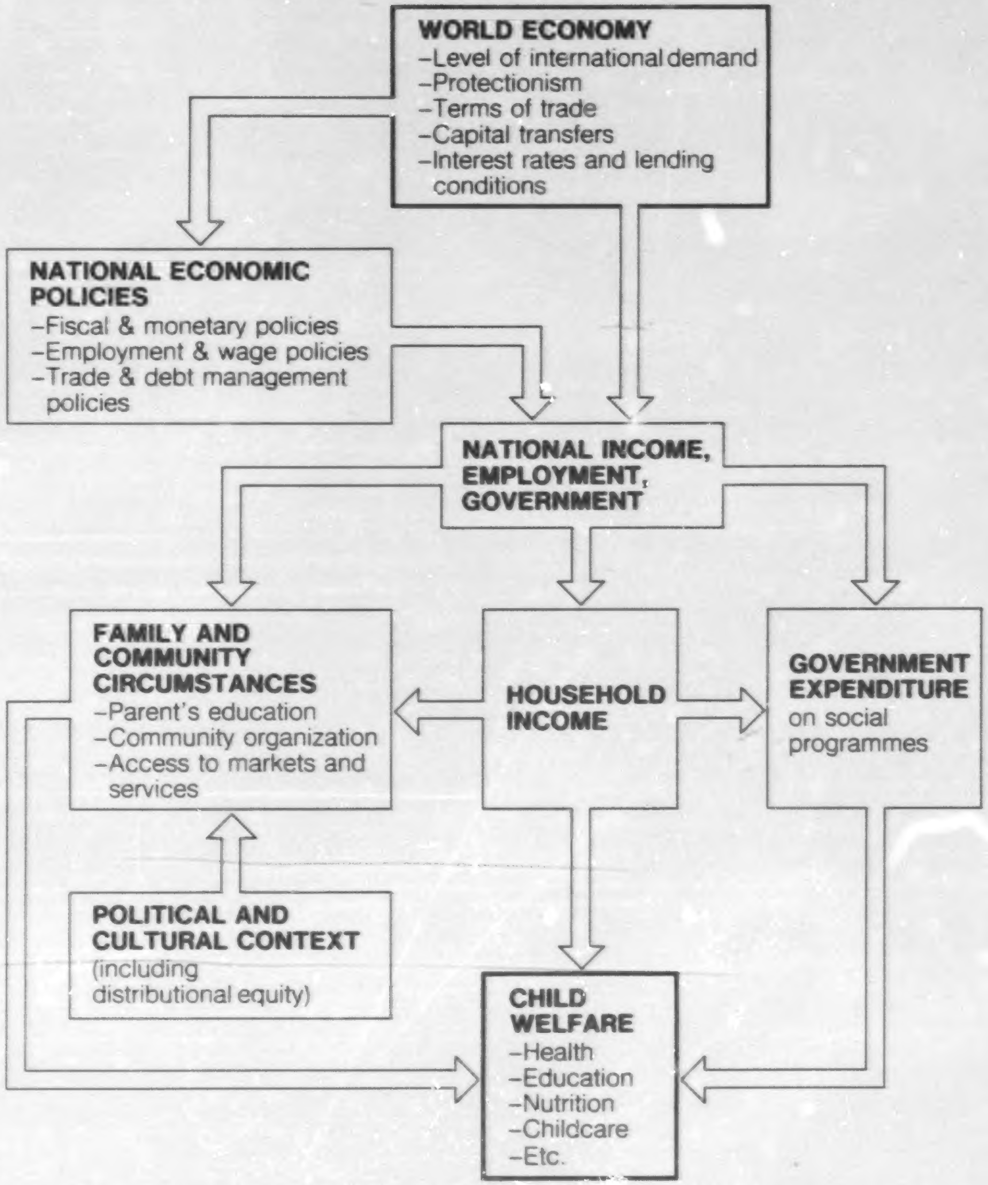
○ Recession in many countries, rich and poor, has led to an increase in unemployment, particularly in urban-based industry and in the export-dependent sector. Per capita income in an increasing number of countries has fallen (See Table 3). Real household *incomes have been reduced* drastically even in countries with some system of unemployment or welfare payments through a combination of rapid inflation and growing unemployment. In certain cases (e.g. Costa Rica, Zambia) the fall in real salaries and incomes over the last few years has been of the order of 30–40%.

○ Although firm and systematic evidence is not available, there are indications (e.g. Chile, USA), that the fall in real incomes has been particularly severe for the poorest groups in society. Because the poor tend to have larger than average families, this *deterioration in income distribution* is likely to have been particularly detrimental for a disproportionately large number of children.

○ Cuts in social services are often the first to take place so that the *share of social expenditure out of the total is shrinking* in all but a few cases. As a result, real social expenditure in 1982 in Chile was 7% less than in 1974. The comparison is even less favourable if carried out in per capita terms (in

Chart 3:

How the recession reaches the child


WORLD ECONOMY
–Level of international demand
–Protectionism
–Terms of trade
–Capital transfers
–Interest rates and lending conditions
NATIONAL ECONOMIC POLICIES
–Fiscal & monetary policies
–Employment & wage policies
–Trade & debt management policies
NATIONAL INCOME, EMPLOYMENT, GOVERNMENT
FAMILY AND COMMUNITY CIRCUMSTANCES
–Parent's education
–Community organization
–Access to markets and services
HOUSEHOLD INCOME
GOVERNMENT EXPENDITURE on social programmes
POLITICAL AND CULTURAL CONTEXT (including distributional equity)
CHILD WELFARE
–Health
–Education
–Nutrition
–Childcare
–Etc.

Chile as well as Brazil). Even in some countries deliberately aiming at protecting the poor, social expenditure on basic needs declined (in Tanzania, from 26% to under 20% of the total in only a few years).

○ *Cuts in education* and food subsidies seem to precede those in health services. In general, since the mid seventies, educational expenditures have shown a downward trend as proportions of total public expenditure and the GNP. As UNESCO has pointed out, between 1970 and 1977–78 the proportion of total public budgets allocated to education in the developing countries declined on average from 16 to 15%. Information for recent years is unavailable, but sample figures indicate a continuation of the downward trend.

○ In many developing countries (because of transport and other problems) cuts in services are much sharper for the rural than the urban areas.

In conclusion, when judging on the basis of the availability of incomes and resources for children, the deterioration appears widespread, unambiguous and, in some cases, extremely severe. The situation would have been worse but for increases in world food production and low international prices which averted the recurrence of the 1974/75 situation (when the slump in the world economy was accompanied by a world food shortage and high international food prices —see panel page 166).

The impact on the availability of services

○ The picture is complex. Certain countries have been affected by an *absolute decline in the amount of services offered.* In the USA, the overall public health staff for child-care, outreach, and difficult follow-up cases has dropped while prenatal care services for women declined substantially over the last two years. In Northern Zambia the number of child clinics declined in the second half of the 1970s, while in Chile there has been a rapidly diminishing availability of housing, potable water, electricity, sanitation and sewerage services in low income areas. In the latter country, admission to primary education dropped by 11% while the number of school lunches available for children aged 6–14 has been curtailed.

○ In certain countries (Sri Lanka, Italy, USA, Chile) the availability of services has been implicitly reduced by the *introduction of fees* for services which previously were provided free of charge, or by cutting subsidies on basic need items (food and kerosene) so as to increase their market price and thus reducing their availability to poor people.

○ In a third group of countries, the cuts in social expenditure have resulted not so much in a *quantitative* as in a *qualitative* decline in the services rendered. Enrolment ratios have often continued to increase (Tanzania) but so have pupil/teacher ratios. The decline in quality of education is compounded by the dramatic fall in availability of books, paper, pencils and other teaching materials. In Brazil and other countries the quality of the teaching, teachers' morale and adequacy of instructional material is reported to be worsening. Literacy and non-formal education programmes for women are declining in most cases, except those (Cuba and Tanzania) where a strong political commitment to mass education protects them against economic adversities. The recessionary squeeze appears to have also put a damper on the expansion of pre-school child care programmes as they do not command the type of political support enjoyed by primary education. Where the number of primary health clinics have been maintained or even increased (Tanzania), the supply of drugs, vaccines, and other necessary inputs has become extremely irregular seriously hampering their normal functioning.

One may conclude therefore that there has been a general *contraction in the quality and often quantity of child-related services.* This is particularly troublesome for a large number of developing countries where, because of accumulated backlogs and high population growth rates, there should be a substantial acceleration, rather than contraction, of services which are essential for child survival and development.

The Impact on Child Survival and Welfare

○ In most of the case study countries for which there are data, the number of people and *children living below the poverty line shows an upward trend.*

○ While infant mortality rates (and several other child welfare indicators) continue to show some signs of improvement, in most cases analysed there are indications that where the recession has been particularly severe, the infant mortality rate has increased in the hard hit areas, as in Sri Lanka's plantation sector and in several U.S. locations. As mentioned, previously, these are areas where unemployment has risen to double-digit figures, real wages have dropped, and government services curtailed. Previous findings for Brazil, Costa Rica and Bangladesh also support this correlation between infant mortality rate and economic deterioration. Lack of recent reliable data prevents the substantiation of anticipated increases in infant mortality rates in several parts of Africa.

○ In a number of other cases the *decline in infant mortality rates apparently has been slower than it would have been in the absence of recession.* For Italy a recent econometric study shows that although the infant mortality rate decline up to 1980 was quite respectable, the rapid rise in unemployment over the last two years may have produced a statistically significant slow-down in its rate of decline. Similar phenomena are observed in Brazil and Costa Rica, where it is feared that the downward infant mortality rate trend may be shortly reversed, and in rural India, where the infant mortality rate has stagnated over the last ten years.

○ Even in countries where the infant mortality rate has continued to decline, there is a *deterioration in nutrition indicators.* In Costa Rica the number of children treated for severe malnutrition has doubled over the last three years, and in Brazil the decline in the infant mortality rate has been accompanied by an increasing share of infant deaths due to malnutrition. There are some indications that in the U.S. and Brazil the incidence of low birth weight babies has increased. A marked increase in wasting is found in Sri Lanka between 1975/76 and 1980/82, perhaps as a result of the cut in food subsidies. Stunting among poor children appears to be on the increase over the last few years in the U.S. while height for age declined for all four age groups of children in some of Zambia's poorer northern regions.

○ *Stagnant or deteriorating health conditions* are also found in a number of countries despite notable declines in mortality. Situations as different as those of Brazil, Sri Lanka and Kerala continue to be characterized by a high incidence of morbidity in general or of infectious diseases in particular. In Chile, typhoid fever and hepatitis are on the increase, possibly because of cuts in government expenditure on drinking water and environmental sanitation. In the U.S., the general deterioration in health status among low income groups is accompanied by a resurgence in TB (an illness associated with unhealthy environment).

In sum the resulting picture is somewhat ambiguous. While a dramatic and general deterioration in child survival is not evident (again with the very likely exception of Africa and other poor countries or regions), *warning signals* concerning various aspects of child welfare are becoming more and more frequent and raise fears about the future for particularly vulnerable groups.

Other Effects

○ There are indications of *increasing child labour* in agriculture (India) and in various sectors of the economy (Philippines) with obvious negative effects on their health and education.

○ *Child abandonment and vagrancy* has increased in Costa Rica, while in Brazil the number of children given up by their parents, because of poverty, has also increased. In Chile the pressure of seeking remunerated employment for women has meant that young children have increasingly been left abandoned to themselves or to their siblings.

○ *Youth delinquency* has increased sharply in Italy and in the U.S. the suicide and homicide rate among young blacks has risen in recent years.

○ Lastly, there has been an *increase in the incidence of female headed families* in many regions of Africa (Zambia, South Africa, Senegal) where men are obliged to migrate in search of jobs. In the U.S. one notices a sharp increase in female headed families (which have a strikingly lower level of income per capita than two parent or male headed households). In Sao Paulo female headed families increased between 1970 and 1977 by 20%.

Data limitation and time-lags in the assessment of the social effects of recession

Empirical evidence of the effects of recession on children can not be any stronger than the data gathering system which attempts to document changes in child welfare. In most developing countries, this system is weak and, in some especially remote and disadvantaged areas most clearly affected by economic crisis, virtually non-existent.

A more complete understanding of the social impact of recession also requires consideration of the time lags associated with the consequences of economic difficulties. There are several reasons suggesting that the full effects of the current economic situation may not yet be evident:

(a) While the latest recession began in some countries in late 1979 and 1980, it only became worldwide in 1981. However, only limited data are available for 1981 and 1982 – and virtually none at the time of writing for 1983.

(b) Time lags of one or more years may often exist between economic recession and deterioration of social indicators. The length of the lag is likely to vary with a country's level of income and

Table 3: Growth Rates of Gross Domestic Product and GDP per capita in case Study Countries 1979–82

	Growth Rate of Gross Domestic Product				Growth Rate of GDP per Capita			
	1979	1980	1981	1982	1979	1980	1981	1982
Brazil	6.3	8.2	−1.9	1.1	4.2	6.1	−4.0	−1.0
Chile	8.0	5.4	5.3	−14.1	6.5	3.9	3.8	−15.6
Cuba*	3.8	4.1	..	..	2.6	2.9	..	..
Costa Rica	5.1	1.7	−3.6	−5.9	2.7	−1.0	−6.0	−8.3
India	−3.6	6.3	5.8	2.8	−5.8	4.1	3.6	0.6
Sri Lanka	6.1	10.7	5.6	5.3	4.0	8.6	3.5	3.1
South Korea	7.1	−3.5	6.4	5.3	5.4	−5.2	4.7	3.6
Zambia	−18.9	20.3	−2.0	−4.5	−22.1	17.1	−5.2	−7.7
Tanzania	5.0	4.0	−3.6	−3.0	1.9	0.9	−6.7	−6.1
Nigeria	12.8	3.4	−3.0	−6.0	9.4	0.0	−6.4	−9.4
Italy	4.5	3.9	−0.2	−0.3	4.1	3.5	−0.6	−0.7
USA	2.3	−0.2	2.0	−1.7	1.6	−0.9	1.3	−2.4
No. of countries with negative growth rates	2	2	6	7	2	4	6	8
Total no. of developing countries with negative growth rates	10	17	32	29	15	30	42	51

Source: United Nations Department of International Economic and Social Affairs.

* Net Material Product

Food:
The shadow of surplus

Although falling short of the United Nations target of 4% growth, food production has been increasing both in absolute and per capita terms over the last few years in most areas of the world with the exception of Africa. The possibility of global food shortages emerging in the short run has receded, while surpluses overhang the markets of all major foodstuffs. In 1982 and part of 1983, international grain prices have been at their lowest level in several years, although they have shown a tendence to rise in the second part of 1983.

There are, however, dark shadows in this picture. In the first place the big surpluses are in North America and Europe, not in food-short developing countries which have become large scale food importers. Second, the rich surplus countries show little present inclination to step up food aid. This means that an increasing share of the rising food imports has to be on commercial terms. Thus the falling proportion of food imports available as food aid offsets the advantage of low international prices. Third, although there has been an increase in food production per capita in most developing countries outside Africa, it has nevertheless been insufficient to meet rising food requirements. Fourth, while international prices for food are low today, domestic prices have often increased because of urbanisation, inflationary pressures and also partly because of a definite shift in policies. Finally, the gains in production have often by-passed the poor, and their children, because of their lack of purchasing power.

Thus what is needed is not only an increase in food production, but changes in the system of international agricultural adjustment, in food security and in domestic income distribution, and a policy of better nutrition for children built into these international and domestic adjustments.

The relatively low international food prices prevailing recently have undoubtedly helped alleviate the burden of food importing developing countries and prevented the recurrence of another situation like that of 1973/4 (when the slump of the world economy was accompanied by a world food shortage, high international prices of grains and famine in many parts of the world). But there is a danger that the 1983/84 grain harvest will be lower than the previous years and that prices may rise sharply, while the structural problems already discussed will have to be dealt with if more propitious conditions for child development and nutrition are to be assured.

social infrastructure (like the public health system), as well as the severity and length of the crisis. In Bangladesh, for instance, a doubling of food prices in 1974–75 was followed almost immediately (two month lag) by an increase in crude death rates. Where greater resources are available, longer time lags can be explained by the willingness of families to draw down their savings and food reserves, and to liquidate their working capital or incur debts rather than reduce food and other essential consumption below critical levels. Similarly, governments typically try to delay cuts in social expenditures, particularly of a politically sensitive nature. Many public sector outlays already in the pipeline cannot easily be reduced. All in all, there are indications that it may typically take from one to two years before an economic crisis may actually result in a drop in quality and quantity in the social service delivered and in a measurable decline in standard social indicators.

(c) A number of indicators of child welfare (e.g. infant mortality, rates of morbidity and malnutrition, educational enrolment rates) are strongly influenced by deep-rooted social and cultural characteristics (like levels of mothers' education, hygienic customs, traditional health practices, etc.) which help to cushion the effects of economic misfortunes. The strength of the positive aspects of these cultural circumstances will determine in part the length of the time period during which families can avoid the most serious consequences of recession. Similarly, with regard to governmental institutions, the capacity of the public sector to make appropriate adjustments to declining revenues will depend to some extent on past investments in the development of staff capacities and morale, as well as managerial competence and flexibility.

Taking into account the limited data available and the matter of time lags, four important conclusions emerge: first, that some of the worst effects of the crisis are not perceived because they are not measured; second, that the worst consequences of the current recession, in terms of child welfare, may still lie ahead; third, that the initial signs of deterioration now appearing should be seen as important *warning signals* of much more serious problems that can perhaps be avoided only if concerted action is taken immediately; and finally, that a responsible and cost-effective response to these warning signals must include in most countries the building up of a better reporting and statistics system for the continuous monitoring of the health, education and general well-being of children, especially those belonging to the poorest, most vulnerable communities.

Conclusions for Action

A very real deterioration has and is taking place in the lives of children around the world. While the initial worsening has been somehow slowed — particularly in middle-income countries – by the existence of resources, experience and facilities accumulated in the past – there are valid reasons to believe that the present crisis could turn into a major setback – particularly for the very poor people and countries – in a matter of a few years. Therefore the evidence provided by this chapter should be considered indicative of the deterioration that has already occurred, and also as a warning signal of a much greater worsening in child welfare which would inevitably take place within a relatively short period of time. The implications are obvious: take action now, to remedy the situation and prevent further deterioration. The benefits of timely action can be considerable and, as this whole report makes clear, in many high priority areas, need not be costly. Moreover, the very multipliers which have reinforced deterioration on the downward path can

The Need:
A child monitoring system

One of the major obstacles in assessing the changing conditions of children is the lack — even in the most advanced countries - of a system reporting on the health status and welfare of children in a timely fashion. Information on government expenditure on child welfare is either lacking or incomplete and long delays in its availability diminish further its value for timely policy-making. Data on child status are almost universally derived from ad hoc surveys, the coverage and frequency of which do not usually allow prompt reporting on fluctuations in the state of children. Needless to say, the situation is worst in the poor countries where the vital registration system has a low and fragmentary coverage, where sample surveys on childrens' conditions are rare and monitoring by private groups is virtually non-existent.

This depressing lack of data can be contrasted with the relative abundance - at times a flood - of information about trade, production, interest rates, etc. In industrialized countries, for instance, it is not uncommon to obtain detailed information, even on a monthly or weekly basis, on the number of dishwashers in use or on the number of tins of cat-food sold.

How can these information gaps be bridged? How can such problems be tackled? Two complementary ideas are proposed hereunder:

(a) Promote the development in all countries of some form of *child monitoring system*. Several of the case studies analyzed have emphasized that the development of a public policy needs to be informed not only by periodic surveys, but by a continuous national monitoring process that reports promptly on fluctuations in health status, risks affecting children and their general welfare conditions. At present, almost no country in the world possesses of such a monitoring system. A start has been made in some countries but this needs to be greatly strengthened and its adoption generalized. National central statistical offices could become the co-ordinating mechanism for such an effort, including regular data on nutritional status, immunization coverage, etc. in their statistical publications. National efforts at establishing such a system should be backed by the international community. The United Nations Statistical Office, UNICEF and other U.N. agencies could initiate discussions about the design of a standardized permanent child monitoring system. The drive towards its general adoption could be accelerated by the authority of a resolution of the General Assembly of the United Nations, while the technical agencies (including UNICEF) should stand ready to provide financial and technical assis-

(continued over)

reinforce the spread of benefits on an upward cycle.

In contrast, the human costs of the failure to act may well be compounded in the future, as delayed results of existing recession are made worse by further cutbacks. The gradual deterioration and dismantling of the social capital and infrastructure built up over the last two or three decades could do untold damage to millions of the world's population – and could take many years to repair.

Two broad areas of action are required: action to offset the serious consequences for children (and others) of recession, and action to restore momentum in the long-term development effort. Both areas require changes in policy and practice – internationally and within countries.

Within countries, there is need (and potential) for action at various levels, from individuals and their families, workers and officials in health services, schools and other community services at local level to officials and leaders, both government and non-government at regional and national levels.

But basic changes in *national and international policy and practice* are also vital because their responses to recession are holding back and often undercutting positive and low-cost remedial action *at lower levels*. Households are less able to cope with the problems of their own children through declining incomes and employment; clinics and schools are less able to respond because their budgets have been cut but overall policy has not been restructured; even productive capacity at local level has commonly been sacrificed, as a by-product of national policy, in spite of widespread evidence of the greater efficiency of small scale, local level production in terms of employment creation, capital saving and low levels of import and foreign exchange use – the very constraints which are transmitted internationally by recession and which all but the largest or most insulated economies have no choice but to respond to.

Needed: A Broader Approach to the Adjustment Process

The tendency for governments faced with recession to cut back on child-focussed social expenditures (and measure which support poorer families) arises from many sources, domestic as well as international. But international influence is often critical, especially when linked to the negotiation of an IMF agreement or an international loan. This international influence may be felt in various forms and degrees: as a clear condition of an agreement, as the technical advice of international experts or as the orthodox wisdom promoted in courses or less formal contacts.

The starting point is a broader approach to adjustment policy at both national and international level. The issue is not whether to adjust but how. Some adjustment to the squeeze on foreign exchange and government budgets is an unavoidable fact of life for all but the largest and richest countries (where, if adopted, it often reflects domestic choice of policy more than international necessity).

A broader approach to the adjustment process would comprise five elements:-

1. First and foremost, a clear recognition of the importance of preserving a minimum level of nutrition, household income (in cash or kind) and basic services for all groups of the population, as a means towards protecting and maintaining human investment and welfare.

2. Second, the maintenance or creation of a network of basic services and support for young children, the most vulnerable group of the population yet also the one most important for the economic, social and political future of a country and, at the same time in most respects, the one least costly to protect.

3. Third, a serious restructuring within the health, education and related social services to achieve greater cost-effectiveness and internal efficiency in the provision of those services.

4. Fourth, more use and more creative use of community action and the informal sector, which tend to use more local and low cost resources and fewer high cost and imported supplies.

5. Finally, more concern with income distribution, not less – especially in the sharing of the burden of economic adjustments and cutbacks.

These five points would add up to a more conscious concern with the longer run dimensions

The Need:
A child monitoring system (cont)

tance. Why should the task be given lower priority than collecting data on cat food?

(b) *National Symposia on Children.* The other need is for national discussion and review of the coordinated action to improve the situation of children. In the case of Sri Lanka and South Korea such Symposia have recently been held bringing together decision makers in national and regional government, and those particularly knowledgeable in and concerned with the problems of children and other community representatives: journalists, community workers, academics, etc. The 3–4 day agenda included questions of child nutrition, education, health, welfare of mothers. The discussions focussed on problem areas where recent deterioration or difficulties had been experienced and new policies dealing both with such immediate problems as well as longer-range social planning on behalf of children could be discussed.

The Korean Symposium was closely tied in with the preparation of the new Five Year Development Plan. Largely as a result of the information assembled for the Symposium and the evidence presented at it, the new National Development Plan included greatly increased allocations and higher priorities for the social sector in general and for social policies dealing with children in particular.

The Sri Lanka Symposium, organized by the Children's Section of the Ministry of Planning (an arrangement which other countries might study), was distinguished by the wide and active participation of the economic government departments, including the Central Bank and the Ministry of Finance. The basic document was an authoritative survey of "Changing Needs of Children – the Experience of Sri Lanka". The Symposium played a considerable part in subsequent developments and also in arousing public interest and kindling national discussion.

Some of the key questions to be asked in these national assessments are the following:

What are the main ways children have been affected by recession, especially children in low-income families and in the poorer and remoter regions of the country? Is there evidence that preventive services have been cut back at the cost of more expensive curative action being required later? Is there evidence that "the worst is yet to come" – and if so, what actions can be taken to prevent or, at least, ameliorate it? Which actions for which age groups or geographic regions deserve priority? Within each country, it will be useful to identify different levels of action, from family and community through to the local, regional, state and national levels.

of adjustment and assisting a pattern of restructuring which can sustain the above services from domestic resources in the longer run.

International action

The very subject of this chapter, *world recession*, however, requires that particular attention be given to international action. What might be done internationally to offset the effects on children, to prevent further deterioration and avoid the worst? What can be done to restore momentum and, as UNICEF has argued elsewhere, to make possible an acceleration in child health and survival even at a time of world recession?

In terms of children's needs, one can emphasize several major areas of international action:

○ a greater measure of co-ordinated action by the main industrial countries to stimulate a higher level of world economic activity; to lower interest rates; and to reduce import barriers and trade restrictions, especially for the poorer countries.

○ a change in international financial institutional arrangements to prevent the main burden of adjustment from falling on the deficits of poorer countries and to introduce a broader approach to adjustment and conditionality that protects the living standards of the poorer and more vulnerable sections of the population.

○ measures to reduce the risk of war and to achieve some shift from military and armaments expenditures to development, in both developed and developing countries.

○ a higher level of official development assistance to developing countries: in the early 1960s, this averaged 0.5% of the GNP of the industrial countries compared with 0.35% in 1981 and with the long established international target of 0.7%.

○ expanded and more effective co-operation between developing countries.

These areas of action are fundamental and lack of action is deeply frustrating. Millions of words have been spoken in debate over these themes over the last ten years – and millions more written in books, documents, and proposals of what might be done. By comparison, international action has been minuscule, held back by conflicting interpretations and philosophies, marked differences in the wealth, power and influence of different countries, lack of decisive leadership and the development of new forms of organization and technology which make international co-operation and control more difficult, even if wanted. On the spectrum between progress and stalemate, a frank account would characterize the situation as nearer stalemate than progress.

Nevertheless, for those concerned with child welfare, the need for international action cannot be avoided. Child development ultimately depends on broad-based economic and social development. Such development is currently held back in many countries by international economic relationships and institutions which inhibit rather than encourage the basic changes needed. To the extent that progress is made towards ending recession or towards any of the above structural changes, the potential for child development would have been advanced, very considerably in some cases.

Many other proposals could no doubt be added. But the order of magnitude of the benefits from the changes set out above could be very large and positive – much larger than the financial gains from increases in aid alone. Measures to end recession, to stimulate trade and ease financial constraints would be considerably more important than aid transfers, at least for all but the poorest countries.

The least developed countries are a special case. Their need for concessional assistance is clear and great, but in their case also the prices and access of the primary commodities on which they depend for their foreign exchange earnings are of dominant importance. Just as the intensified recession since 1981 has had a disastrous impact on their terms of trade, so a revival of the world economy should result in a recovery of their terms of trade. But this may not happen automatically, at least not in sufficient degree. So it may have to be supported by structural changes in the field of primary commodity trade, by giving the least developed better access to their main markets, encouraging more processing of their commodities before export, extending the preferential treatment now accorded them and also giving them special treatment in the matter of debts. Their total debts may look small in the grand total of $700 billion which mainly falls upon the middle-income and centrally planned economies, but because of their small GNP per capita, the burden is in fact heavier on them than on the middle-income countries. The low-income countries in 1980, other than China and India, had an outstanding public debt equivalent to 31.4% of GNP compared with 15.4% for middle-income oil importers – yet their international reserves covered only 2.1 months of imports compared with 3.8 months for middle-income oil importers. By 1983 the situation was much worse. Revival of the world economy is essential for the low-income countries but is not enough. It must be combined with structural changes and enlightened international action – but then such changes and such action may be more easily initiated in the context of a revived world economy.

Military expenditure – a costly diversion from development

Nowhere are the potential gains greater – and current disproportions more grotesque – than in the rising levels of expenditures on armaments, in rich and poor regions of the world alike. In developing countries, expenditure on armaments and the military exceeds expenditure on education or health – and in many of them, military expenditure is still rising. The gain in health or education which could be achieved by even small shifts of resources and foreign exchange could be very large in comparison with existing expenditures in these sectors. The total world cost of eradicating smallpox (over 10 years) was the cost of a squadron of the latest fighter bombers – well under one tenth of 1% of what the world spends on armaments each year. The cost of providing immunization and basic health for every child would in any country be even smaller in relation to military expenditure.

National action towards a child health revolution

It is at national level that the first moves must be made. Though international action can greatly help, in no country need child-focussing action await international action, as pioneering experience in many countries, large and small, rich and poor has shown. Three broad priorities for action can be identified following the analysis of the impact of recession. They are:

1. measures to maintain levels of household income and employment, especially in relation to the basic needs of poorer families;

2. measures to sustain basic services, especially in basic health, primary education and other action related to basic services;

3. measures to restore or sustain momentum in long-term development and advance, especially in relation to basic family circumstances and priorities for accelerating child health and survival.

In addition to these broad based measure the call for a child health revolution is especially significant in this regard. One of the worst effects of recession is the sense of hopelessness and negativism which it engenders. When resources are being cut back, it requires unusual vision and determination to seize the opportunity for new advances. Yet this is precisely the opportunity which is presented by the priority actions set forth in UNICEF's 1984 *State of the World's Children* report. The actions are made more necessary by the set-backs of recession; and, at the same time, the actions proposed are made more relevant by their low cost nature and their reliance on community participation and organization. They could and should become the leading edge for a range of action focussed on child development.

The world needs to be confronted with the consequences of current economic policies and the possibilities of clear alternatives. Even this preliminary study shows that looking at child welfare can reveal a reverse image of the world economies. We are used to describing the flows of money and wealth, with their effects on human life seen as incidental consequences. If we start, instead, with men, women and children as what matters, we trace the same international links in a wholly new light: the economic numbers become background, the human consequences come to the fore. When this glimpse of another reality becomes an accepted and legitimate pre-occupation of international and national economic policy, we may take more hope for the welfare and future of the world's children.

V

STATISTICS

Economic and social statistics on the nations of the world, with particular reference to children's well-being

The pattern of child deaths (Figs. 3.1 to 3.8)
Country Index to Tables
Definitions, main sources, general note on data

TABLES

1: Basic Indicators
IMR □ population □ child population □ GNP per capita □ life expectancy □ adult literacy □ school enrolment □ income distribution

2: Nutrition
Low birth-weight □ breastfeeding □ malnutrition □ food production □ calorie intake

3: Health
Access to water □ immunization of children □ immunization of mothers □ life expectancy

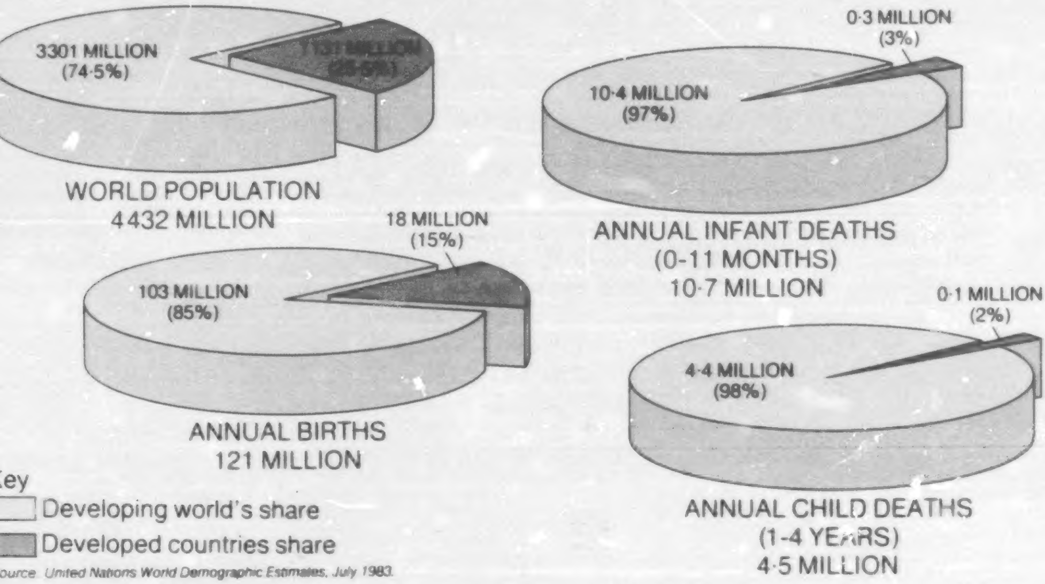
4: Education
Male and female literacy □ primary school enrolment □ secondary school enrolment

5: Demographic Indicators
Infant deaths □ child deaths □ death rate □ birth rate □ fertility rate □ population growth

6: Economic Indicators
GNP per capita □ growth rate □ inflation □ poverty □ urbanisation □ aid

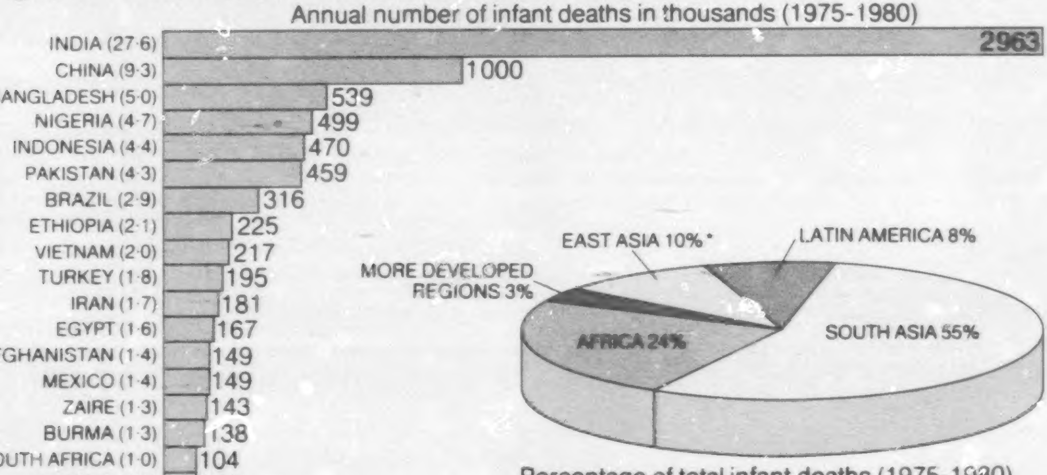
Footnotes and Source notes for Tables 1–6

ig. 3.1 **The developing world's share of population, births, and deaths**



ource: *United Nations World Demographic Estimates, July 1983.*

ig. 3.2 **Where children die: countries with the greatest number of infant deaths**



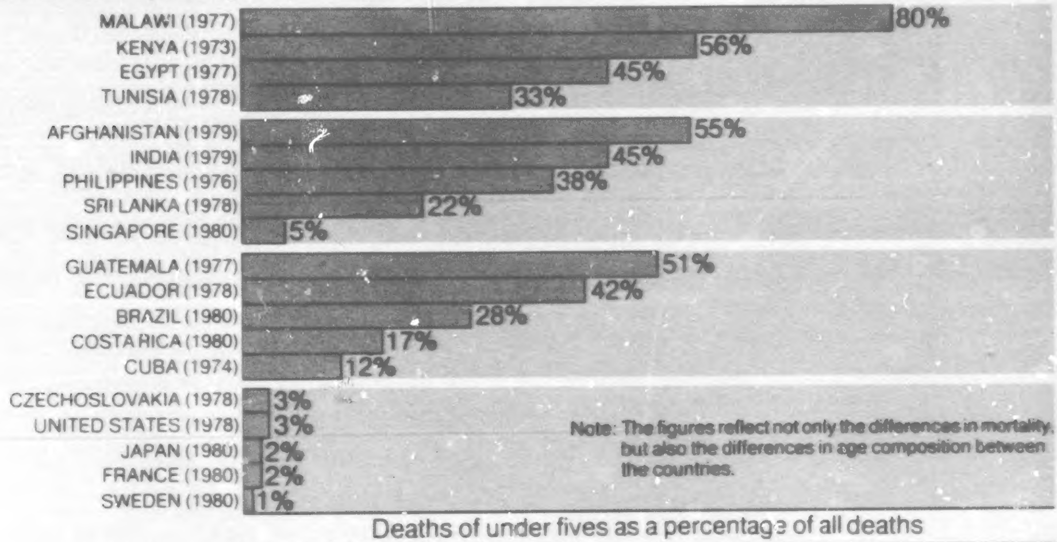
Percentage of total infant deaths (1975-1980)

Note: *East Asia excludes Japan.

Note: Figures in parentheses are the percentages of the world total.

Fig. 3.3 The child's share

Deaths under five years of age as a percentage of total deaths in selected countries.

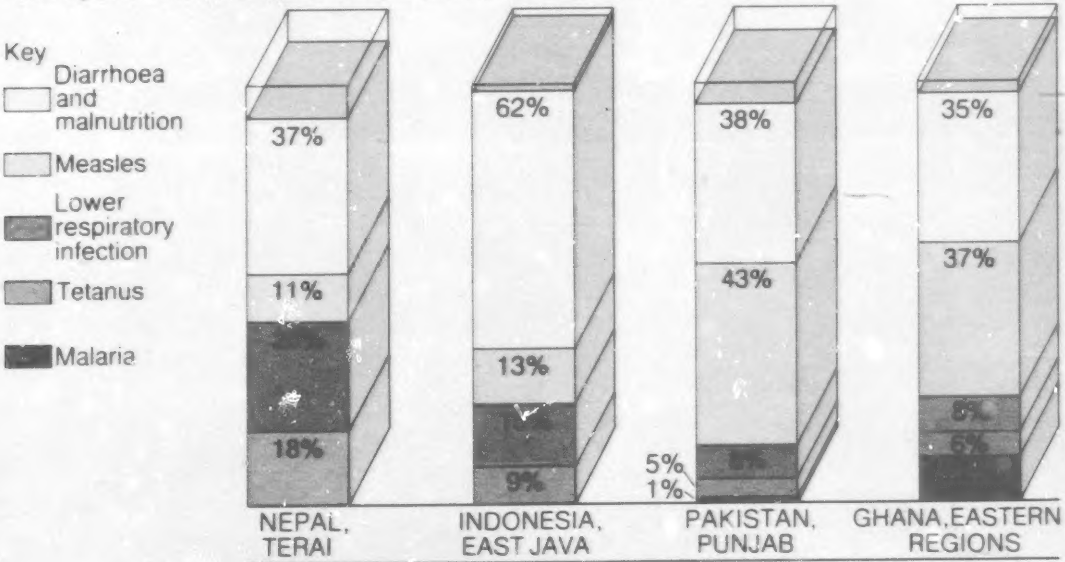


Note: The figures reflect not only the differences in mortality, but also the differences in age composition between the countries.

Source: United Nations Demographic Yearbook, 1981

Fig. 3.4 Why children die

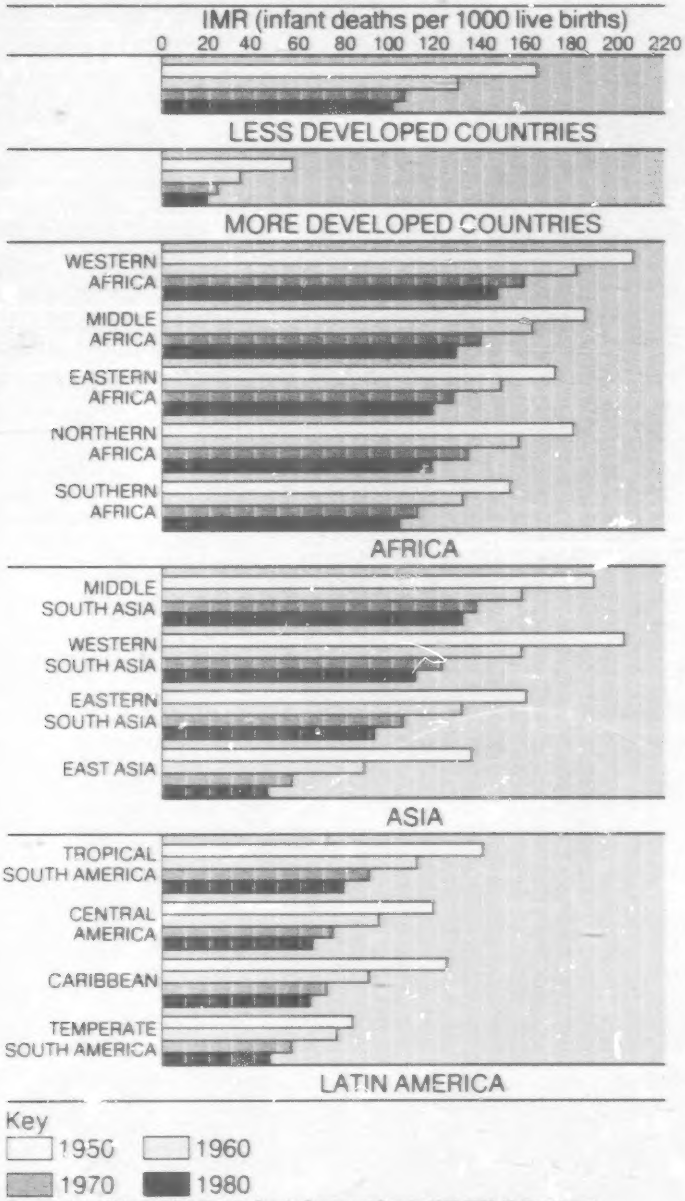
Percentages of infant and child (ages 0-4) deaths due to preventable diseases in selected countries.



Source: Robert N. Grosse. Interrelation between health and population: Observations derived from field experiences. Social Science and Medicine. Vol. 14c, No. 2. June 1980 p.103.

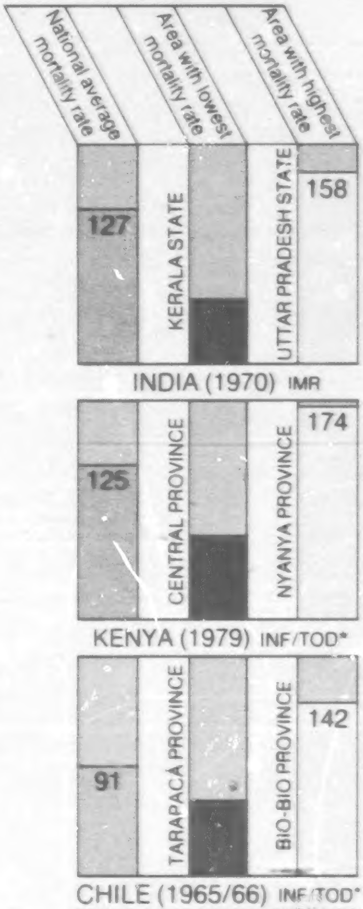
Fig. 3.5 Reducing child deaths

Trends in infant mortality in the developing countries, 1950-1980.



Source: United Nations. Infant Mortality Rate by Region and Country 1950-2025, Medium Variant. Population Bulletin of the United Nations, No. 14, 1982 pp.36-41.

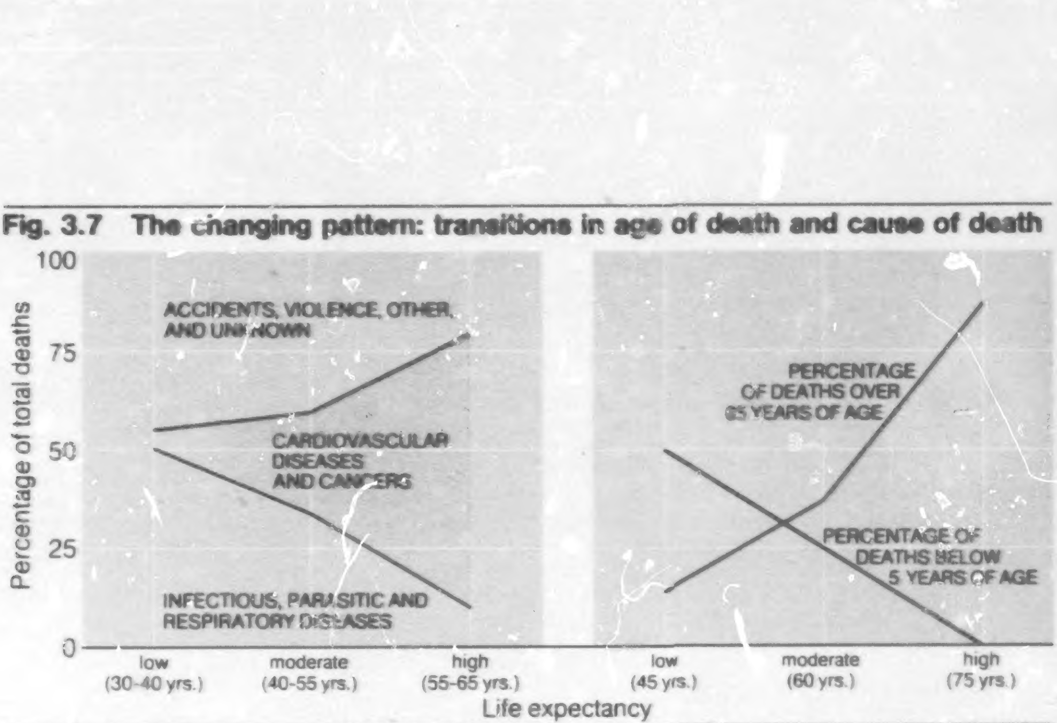
Fig. 3.6 Differences within nations



Note: * The infant/toddler mortality rate is the number of deaths before age two per 1000 live births.

Sources: Derived from: (1) Government of India, Ministry of Health & Family Welfare, Year Book, 1975-76, New Delhi. (2) W. Henry Mosley, Will Primary Health Care Reduce Infant and Child Mortality? A Critique of Some Current Strategies, with Special Reference to Africa and Asia. Paper Prepared for the International Union for the Scientific Study of Population (IUSSP) Seminar on Social Policy, Health Policy and Mortality Prospects, Paris, February 28-March 4, 1983. (3) La Mortalidad en Los Primeros Anos de Vida - En Paises De La America Latina: Chile, 1965-1966 (by Hugo Behm and Monica Correa), Centro Latinoamericano de Demografia (CELADE), San Jose, June 1977.

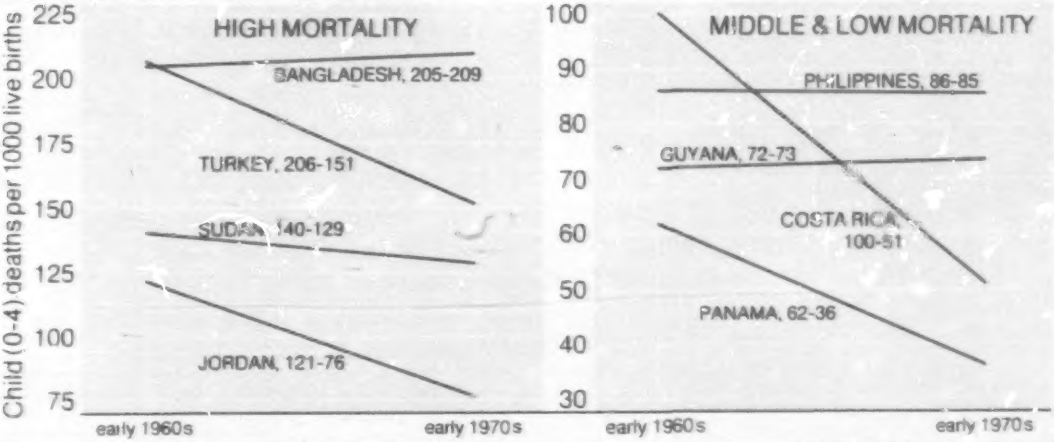
Fig. 3.7 The changing pattern: transitions in age of death and cause of death



Sources: Data on cause of death for moderate and low mortality are from World Health Organization data bank, as presented by United Nations Population Division; figures for high mortality are judgemental extrapolations. Figures on age of death are from West family Coale-Demeny model life tables, incorporating fertility assumption of GRR of 3·0 at high mortality, 2·0 at moderate mortality, and 1·0 at low mortality.

The graphs above describe the two transitions – in age at death and cause of death – which occur as mortality rates move from high to low levels. When death rates are high most deaths occur at an early age and from causes such as diarrhoeal, respiratory, and parasitic infections, and from immunizable diseases. As death and birth rates fall, more deaths occur at higher ages and from causes such as strokes, heart-attacks and cancers.

Fig. 3.8 It can be done: mortality reduction among children under five, some developing country experiences



Source: World Fertility Survey. Findings of the World Fertility Survey on Trends, Differentials, and Determinants of Mortality in Developing Countries. Paper Prepared for the Expert Group Meeting on Mortality and Health Policy. Rome. May 30-June 3, 1983.

General Note on the Data

The data provided in these tables are accompanied by definitions, sources, explanation of signs and individual footnotes where the definition of the figure is different from the general definition being used. Tables derived from so many sources – nine major sources are listed in the explanatory material – will inevitably cover a wide range of reliability. The following general comments on the data might therefore be useful. The data are provided for 130 countries with a population of three quarters of a million or more. Where possible the official government data have been used. In the many cases where there are no reliable official figures, estimates made by the relevant United Nations agency have been used. Where such internationally standardised estimates are not available, we have used the best estimate of the UNICEF field office. All such UNICEF field office estimates are marked with an *

In some cases e.g. Infant Mortality Rate, Life Expectancy, Crude Birth Rate, Crude Death Rate, etc. the figures are part of the regular United Nations work on estimates and projections – in this case by the United Nations Population Division. In some cases e.g. GNP per capita or ODA, the data are the result of a continuous process of revising and updating – in this case by the World Bank and OECD respectively.

It is not feasible to list the data in terms of the reliability as this will vary enormously from country to country within any one subject. As a general guide it would be reasonable to say that data for nutrition and health are weaker than for education which is in turn weaker than demographic data, with the economic data being the most reliable of all. Similarly, the richer a country the more likely that it has provided sufficient resources to produce reliable data – the absence of the share of income data for most of the poorest countries is a good example.

Where possible only comprehensive or sample national data have been used although, as in the table on 'Wasting', there are a few exceptions. Where the figures refer to only a part of the country this is indicated in a footnote.

Because of all the caveats the reader is recommended to use these data with caution and not to draw too much significance from small differences. The remarks of the World Bank, prefacing the statistical annex in the 1983 World Development Report are particularly appropriate — '*Because the coverage of economies is not uniform for all indicators and because the variation around central tendencies can be large, readers should exercise caution in comparing the summary measures for different indicators, groups, and years or periods. Readers should also exercise caution in comparing indicators across economies. Although the statistics are drawn from sources generally considered the most authoritative and reliable, some of them, particularly those describing social features and income distribution, are subject to considerable margins of error. In addition, variations in national statistical practices mean that the data in certain instances are not strictly comparable. The data should thus be construed only as indicating trends and characterizing major differences between economies.*'

It is with these caveats in mind that in ranking countries by the main indicator used in these tables – the estimate of the Infant Mortality Rate – 1981 – we have rounded all rates to the nearest 10 in the case of countries with a rate of 50 or more. Only in countries with rates below 50, where there is probably a very comprehensive registration system, have we rounded the figure to the nearest unit. Throughout the table we have avoided the use of decimals unless its use was clearly necessary in order to show differences as in the case of annual growth rates, inflation rates, etc.

Signs and Explanations

Unless otherwise stated, the summary measures for the four I.M.R. groups of countries are the median values for each group. The median is the middle value of a data set arranged in order of magnitude. Special footnotes are shown at the end of the tables.

T	Total for the group.		Data not available.
*	UNICEF field office estimate.	(.)	Less than half the unit shown.

Most of the IMR figures are estimates prepared by the UN Population Division on an internationally comparable basis using various sources. In some cases, these estimates may differ from national figures.

Index to Countries

In the following tables, the countries are listed in descending order of infant mortality. Countries with the same rates are listed alphabetically. The reference numbers indicating that order are shown in the alphabetical list of countries below.

Afghanistan	2
Albania	79
Algeria	37
Angola	8
Argentina	81
Australia	119
Austria	110
Bangladesh	24
Belgium	111
Benin	9
Bhutan	10
Bolivia	25
Botswana	61
Brazil	62
Bulgaria	104
Burma	45
Burundi	30
Cameroon	38
Canada	120
Central African Rep.	11
Chad	12
Chile	84
China	85
Colombia	72
Congo	26
Costa Rica	98
Cuba	105
Czechoslovakia	107
Denmark	124
Dominican Rep.	67
Ecuador	63
Egypt	31
El Salvador	64
Ethiopia	13
Finland	128
France	121
German Dem. Rep.	112
Germany, Fed. Rep. of	113
Ghana	46
Greece	106
Guatemala	68
Guinea	7
Guinea-Bissau	14
Guyana	82
Haiti	39
Honduras	57
Hong Kong*	122
Hungary	102
India	32
Indonesia	47
Iran	48
Iraq	65
Ireland	116
Israel	108
Italy	109
Ivory Coast	33
Jamaica	99
Japan	129
Jordan	69
Kampuchea	4
Kenya	66
Korea, Dem. Rep. of	90
Korea, Rep. of	91
Kuwait	92
Lao People's Dem. Rep.	27
Lebanon	86
Lesotho	40
Liberia	15
Libya	49
Madagascar	70
Malawi	6
Malaysia	95
Mali	16
Mauritania	19
Mauritius	89
Mexico	74
Mongolia	75
Morocco	50
Mozambique	41
Nepal	17
Netherlands	125
New Zealand	114
Nicaragua	58
Niger	20
Nigeria	28
Norway	126
Oman	29
Pakistan	34
Panama	96
Papua New Guinea	51
Paraguay	80
Peru	59
Philippines	76
Poland	103
Portugal	100
Romania	97
Rwanda	21
Saudi Arabia	42
Senegal	22
Sierra Leone	3
Singapore	117
Somalia	18
South Africa	60
Spain	123
Sri Lanka	83
Sudan	35
Sweden	130
Switzerland	127
Syria	73
Tanzania	52
Thailand	77
Togo	43
Trinidad and Tobago	93
Tunisia	53
Turkey	36
Uganda	54
USSR	101
United Arab Emirates	78
United Kingdom	118
United States	115
Upper Volta	1
Uruguay	88
Venezuela	87
Viet Nam	55
Yemen Arab Rep.	5
Yemen, People's Dem. Re	23
Yugoslavia	94
Zaire	44
Zambia	56
Zimbabwe	71

* *Colony*

Main Sources

Infant Mortality:	United Nations Population Division and World Bank
Total Population:	United Nations Statistical Office and United Nations Population Division
Child Population 0–4:	United Nations Population Division
GNP Per Capita:	World Bank
Life Expectancy:	United Nations Population Division and World Bank
Adult Literacy:	United Nations Educational, Scientific and Cultural Organization (UNESCO)
Primary Enrolment:	United Nations Educational, Scientific and Cultural Organization (UNESCO)
Share of Household Income:	World Bank
Low Birth Weight:	World Health Organization (WHO)
Breastfeeding:	World Health Organization (WHO) and World Fertility Survey
Wasting (acute malnutrition):	World Health Organization (WHO)
Food Production:	Food and Agriculture Organization (FAO) and World Bank
Calorie Intake:	Food and Agriculture Organization (FAO) and World Bank
Access to Drinking Water:	World Health Organization (WHO)
Children's Immunization:	World Health Organization (WHO)
Pregnant Mothers Immunization:	World Health Organization (WHO)
Secondary Enrolment:	United Nations Educational, Scientific and Cultural Organization (UNESCO)
Child Death Rate:	World Bank
Crude Death Rate:	United Nations Population Division
Crude Birth Rate:	United Nations Population Division
Total Fertility Rate:	United Nations Population Division
Rate of Inflation:	World Bank
Absolute Poverty Level:	World Bank
ODA:	Organisation for Economic Co-operation and Development (OECD)
ODA as Percentage of GNP:	Organisation for Economic Co-operation and Development (OECD) and World Bank

Definitions

Infant Mortality Rate:	annual number of deaths of infants under one year of age per 1,000 live births.
Child Death Rate:	annual number of deaths of children aged 1–4 years inclusive, per 1,000 population in the same age group.
Life Expectancy at Birth	the number of years newborn children would live if subject to the mortality risks prevailing for the cross-section of population at the time of their birth.
Crude Death Rate:	annual number of deaths per 1,000 population.
Crude Birth Rate:	annual number of births per 1,000 population.
Total Fertility Rate:	the number of children that would be born per woman, if she were to live to the end of her childbearing years and bear children at each age in accord with prevailing age-specific fertility rates.
Low Birth Weight:	2,500 grams or less.
Breastfeeding:	either wholly or partly breastfeeding.
Prevalence of Wasting (acute malnutrition):	the percentage of children with greater than minus two Standard Deviations from the 50th percentile of the weight for age reference population i.e. roughly less than 77% of the median weight for age of the National Centre for Health Statistics reference population.
DPT:	Diphtheria, Pertussis (whooping cough) and Tetanus.
Adult Literacy Rate:	percentage of persons aged 15 and over who can read and write.
Primary Enrolment Ratio:	enrolment at the primary level as a percentage of the population of the age group corresponding to that level.
Secondary Enrolment Ratio:	enrolment at the secondary level as a percentage of the age group corresponding to that level..
GNP:	Gross National Product.
Absolute Poverty Level:	that income level below which a minimum nutritionally adequate diet plus essential non-food requirements is not affordable.
ODA:	Official Development Assistance.

TABLE 1: BASIC INDICATORS

		Infant mortality rate aged 0–1		Total population (millions)	Child population aged 0–4 (millions)	GNP per capita (US $)	Life expectancy at birth (years)	% adults literate male/female	% of age group enrolled in primary school male/female	% share of household income 1972–1978	
		1960	1981	1981	1981	1981	1981	1980	1979–1981	lowest 40%	highest 20%
	Very high infant mortality countries (IMR over 100)	**180**	**140**	**1301.9T**	**206.2T**	**320**	**47**	**42/19**	**81/49**		
1	Upper Volta	250	210	6.3	1.1	240	44	18/5	24/14	..	..
2	Afghanistan	230	200	16.4	2.9	170[a]	37	26/6	49/11	..	..
3	Sierra Leone	230	200	3.6	0.6	320	47	31/17	45/30[b]	..	..
4	Kampuchea	150	190	6.8	0.8	70[c]	39	78/39	48/35[d]	..	..
5	Yemen Arab Rep.	210	190	5.9	1.1	460	43	18/2	82/12	..	..
6	Malawi	210	170	6.1	1.2	200	44	48/25	70/49	..	..
7	Guinea	210	160	5.1	0.9	300	43	35/14	44/22	..	..
8	Angola	210	150	7.3	1.3	490	42	30/19	85/48[d]	..	..
9	Benin	210	150	3.5	0.7	320	50	40/17	84/39	..	..
10	Bhutan	200	150	1.3	0.2	80	45	../..	15/7	..	..
11	Central African Rep.	200	150	2.3	0.4	320	43	48/19	89/49	..	..
12	Chad	200	150	4.5	0.8	110	43	35/8	51/19[e]	..	..
13	Ethiopia	180	150	32.2	5.9	140	46	11/5[f]	56/30	..	..
14	Guinea-Bissau	190	150	0.8	0.1	190	37	25/13	130/59	..	..
15	Liberia	190	150	2.0	0.4	520	54	42/18	82/50	11[g]	73[g]
16	Mali	200	150	7.2	1.3	190	45	19/8	55/20[h]	..	..
17	Nepal	200	150	15.0	2.5	150	45	34/6	126/53	13	59
18	Somalia	180	150	4.9	0.9	280	39	11/3	38/21	..	..
19	Mauritania	190	140	1.7	0.3	460	44	../..	43/23	..	..
20	Niger	190	140	5.5	1.1	330	45	14/6	29/17[h]	..	..
21	Rwanda	150	140	5.1	1.0	250	46	61/39	74/67	..	..
22	Senegal	180	140	5.8	1.1	430	44	31/14	58/38	..	..
23	Yemen, PDR	210	140	2.0	0.4	460	46	48/16	93/51[b]	..	..
24	Bangladesh	160	130	90.6	16.3	140	48	43/20	76/47	18	42
25	Bolivia	170	130	5.8	1.0	600	51	79/58	90/78	13[g]	59[g]
26	Congo	170	130	1.6	0.3	1,110	60	70/44	../..	..	..
27	Lao, PDR	160	130	3.8	0.6	80	43	51/36	105/89	..	..
28	Nigeria	180	130	79.7	15.6	870	49	46/23	94/70[b]	..	..
29	Oman	190	130	0.9	0.2	5,920	49	../..	81/43	..	..
30	Burundi	150	120	4.3	0.8	230	45	39/15	34/22	..	..
31	Egypt	170	120	43.5	6.7	650	57	56/28	89/63	15	49
32	India	170	120	676.2	95.8	260	52	55/29	86/57	16	49
33	Ivory Coast	170	120	8.3	1.5	1,200	47	45/24	92/60	20	50
34	Pakistan	160	120	84.6	14.7	350	50	39/18	73/30	20[g]	42[g]
35	Sudan	170	120	18.9	3.4	380	47	38/14	60/43	..	..
36	Turkey	190	120	45.4	6.6	1,540	62	80/50	110/93	12	57
37	Algeria	170	110	19.6	3.7	2,140	56	60/24	106/81	..	..
38	Cameroon	160	110	8.7	1.5	880	50	62/36	117/97	..	..
39	Haiti	180	110	5.1	0.9	300	54	34/24	75/64	..	..
40	Lesotho	140	110	1.4	0.2	540	52	58/81	84/123	..	..
41	Mozambique	160	110	10.8	1.9	230	49	44/23	102/78	..	..
42	Saudi Arabia	190	110	9.3	1.7	12,600	55	35/12	77/51	..	..
43	Togo	180	110	2.7	0.5	380	48	46/20	144/89	..	..
44	Zaire	150	110	29.4	5.3	210	50	74/37	104/75[h]	..	..
	High infant mortality countries (IMR 60 to 100)	**140**	**90**	**657.1T**	**103.7T**	**870**	**57**	**68/55**	**105/97**		
45	Burma	160	100	36.2	5.7	190	54	../..	87/81[b]	21	40
46	Ghana	140	100	12.1	2.3	400	54	59/37	77/60	..	..
47	Indonesia	150	100	150.5	20.1	530	54	77/58	119/104	14	49
48	Iran	160	100	39.0	7.0	2,160[b]	58	55/30	121/80[b]	..	..
49	Libya	160	100	3.1	0.6	8,450	57	76/36	../..	..	..
50	Morocco	160	100	20.6	3.7	860	57	41/18	95/58	12[g]	49[g]
51	Papua New Guinea	170	100	3.1	0.5	840	51	48/30	70/54	..	..
52	Tanzania	150	100	18.5	3.5	280	52	53/23[i]	110/98	..	..
53	Tunisia	110	100	6.5	1.0	1,420	61	61/34	119/92	15	42
54	Uganda	140	100	13.6	2.5	220	48	65/41	58/42	17[g]	47[g]
55	Viet Nam	160	100	55.0	8.9	100[k]	63	../..	120/105	..	..
56	Zambia	150	100	6.0	1.2	600	51	79/58	101/89	11	57
57	Honduras	150	90	3.8	0.7	600	59	64/62	96/95	..	..
58	Nicaragua	140	90	2.8	0.5	860	57	61/60[i]	97/103	9[l]	65[l]
59	Peru	160	90	18.3	2.9	1,170	58	89/73	116/108	7	61
60	South Africa	140	90	30.1	4.9	2,770	63	81/81	105/105[d]	..	..
61	Botswana	120	80	0.9	0.2	1,010	57	61/61	92/111	8[m]	60[m]
62	Brazil	120	80	121.5	17.1	2,220	64	76/73	93/93	9	62
63	Ecuador	140	80	8.6	1.5	1,180	62	82/76	109/105	..	..
64	El Salvador	140	80	4.9	0.9	650	63	70/63	74/74	..	..

		Infant mortality rate aged 0–1		Total population (millions) 1981	Child population aged 0–4 (millions) 1981	GNP per capita (US $) 1981	Life expectancy at birth (years) 1981	% adults literate male/female 1980	% of age group enrolled in primary school male/female 1979–1981	% share of household income 1972–1978	
		1960	1981							lowest 40%	highest 20%
65	Iraq	140	80	13.5	2.5	3,020[n]	57	68/32	122/110	..	..
66	Kenya	140	80	17.3	3.8	420	56	60/35	116/103	9	60
67	Dominican Rep.	120	70	5.6	0.9	1,260	62	75/73	105/107	15	54
68	Guatemala	90	70	7.5	1.3	1,140	59	59/44	74/63	13[g]	60[g]
69	Jordan	140	70	3.4	0.6	1,620	62	78/53	105/102[p]	..	..
70	Madagascar	110	70	9.0	1.6	330	48	68/55	100/87[i]	..	..
71	Zimbabwe	120	70	7.6	1.5	870	55	77/61	118/113		
72	Colombia	100	60	28.8	4.0	1,380	63	86/84	127/130	10[g]	60[g]
73	Syrian Arab Rep.	130	60	9.3	1.8	1,570	65	72/35	112/87	..	..
	Middle infant mortality countries (IMR 26 to 50)	**80**	**40**	**1663.8T**	**172.8T**	**1,770**	**69**	**90/85**	**107/104**		
74	Mexico	90	50	71.2	11.7	2,250	66	86/80	121/115	10	58
75	Mongolia	110	50	1.7	0.3	780[a]	64	93/86	107/102	..	..
76	Philippines	110	50	49.5	7.7	790	63	90/88	111/108	14[q]	54[q]
77	Thailand	100	50	47.5	6.6	770	63	93/83	85/80[b]	15	50
78	United Arab Emirates	140	50	0.8	0.1	24,660	63	30/19	117/115	..	..
79	Albania	80	46	2.8	0.4	840[a]	70	../..	109/103	..	..
80	Paraguay	90	46	3.3	0.5	1,630	65	90/83	106/98	..	..
81	Argentina	60	44	28.1	2.8	2,560	71	95/94	116/116	14[r]	50[r]
82	Guyana	70	43	0.9	0.1	720	70	96/93	96/95	..	..
83	Sri Lanka	70	43	15.0	1.9	300	69	87/76	106/100	19	43
84	Chile	110	42	11.3	1.3	2,560	68	94/91	118/116	..	..
85	China	170	41	1007.8	98.0	300	67	../..	132/110	18[o]	39[o]
86	Lebanon	70	40	2.7	0.3	1,070[c]	66	83/64	123/114	11[s]	55[s]
87	Venezuela	90	40	14.3	2.3	4,220	68	84/78	104/104	15[o]	48[o]
88	Uruguay	50	39	2.9	0.3	2,820	71	95/95	107/104	16[t]	46[t]
89	Mauritius	70	34	1.0	0.1	1,270	65	86/72	103/102	14	55
90	Korea, Dem. Rep.	80	33	18.3	2.6	1,130[a]	66	../..	118/114[e]	..	..
91	Korea, Rep. of	80	33	38.7	4.4	1,700	66	96/88	108/105	17	45
92	Kuwait	90	33	1.5	0.3	20,900	70	72/54	98/93	..	..
93	Trinidad and Tobago	50	31	1.2	0.1	5,670	72	97/94	93/95[b]	13	50
94	Yugoslavia	90	31	22.5	1.8	2,790	71	93/81	100/98	19	39
95	Malaysia	70	30	14.4	2.1	1,840	65	79/61	94/91	11	56
96	Panama	70	29	1.9	0.3	1,910	71	87/86	115/111	7[r]	62[r]
97	Romania	80	29	22.4	2.0	2,540	71	97/94	101/101	..	..
98	Costa Rica	80	27	2.3	0.3	1,430	73	92/92	109/106	12[q]	55[q]
99	Jamaica	50	27	2.2	0.3	1,180	71	90/93	98/100	..	..
100	Portugal	80	26	9.9	0.8	2,520	72	85/76	120/116[h]	21[u]	56[v]
101	USSR	33	26	267.7	23.4	4,550[n]	72	99/98	97/97[f]	..	..
	Low infant mortality countries (IMR 25 and less)	**30**	**11**	**838.2T**	**60.5T**	**9,110**	**74**	**96/94**	**100/101**		
102	Hungary	48	21	10.7	0.8	2,100	71	99/98	97/97	26	32
103	Poland	60	21	35.9	3.2	3,900[n]	73	99/98	100/99	..	..
104	Bulgaria	45	20	8.9	0.7	4,150[n]	73	96/93	97/96	..	..
105	Cuba	70	19	9.7	0.8	1,410[a]	73	91/91	113/105	..	..
106	Greece	40	18	9.7	0.7	4,420	74	94/83	103/102	..	..
107	Czechoslovakia	24	17	15.3	1.3	5,820[n]	72	../..	91/92	..	..
108	Israel	31	16	3.9	0.5	5,160	73	96/91	94/96	21[g]	39[g]
109	Italy	44	14	57.2	3.6	6,960	74	96/95	102/101	18	44
110	Austria	38	13	7.5	0.4	10,210	73	../..	100/99	..	..
111	Belgium	31	12	9.9	0.6	11,920	73	99/99	101/101	..	..
112	German Dem. Rep.	39	12	16.7	1.1	7,180[n]	73	../..	95/97	..	..
113	Germany, Fed. Rep.	34	12	61.7	3.0	13,450	73	../..	../..	18	45
114	New Zealand	23	12	3.1	0.3	7,700	74	../..	103/101	..	..
115	USA	26	12	229.8	18.4	12,820	75	99/99	../..	15	43
116	Ireland	29	11	3.4	0.4	5,230	73	../..	101/102	..	..
117	Singapore	36	11	2.4	0.2	5,240	72	88/70	108/105	..	..
118	United Kingdom	23	11	55.8	3.2	9,110	74	../..	104/105	20[a]	39[a]
119	Australia	20	10	14.9	1.2	11,080	74	../..	110/110	..	..
120	Canada	27	10	24.3	1.9	11,400	75	../..	100/100	15	42
121	France	27	10	54.0	3.6	12,190	76	99/99	112/111	16	46
122	Hong Kong	37	10	5.2	0.5	5,100	75	94/77	111/107	16[n]	47[n]
123	Spain	50	10	37.7	3.1	5,640	74	96/91	109/109	18	42
124	Denmark	22	8	5.1	0.3	13,120	75	../..	97/97	20	38
125	Netherlands	18	8	14.2	0.9	11,790	76	../..	100/102	22	37
126	Norway	19	8	4.1	0.3	14,060	76	../..	99/100	19[r]	37
127	Switzerland	21	8	6.4	0.4	17,430	76	../..	86/87[h]	..	..
128	Finland	21	7	4.8	0.3	10,680	75	../..	83/83	20	37
129	Japan	30	7	117.6	8.3	10,080	77	99/99	101/101	..	..
130	Sweden	17	7	8.3	0.5	14,870	77	../..	97/97	20	37

TABLE 2: NUTRITION

		% of infants with low birth-weights 1979	% of mothers breast-feeding 1975–1980			Prevalence of wasting aged 12–23 months (% of age group) 1975–1979	Average index of food production per capita (1969–71=100)	Daily per capita calorie intake as % of requirements 1980
			3 months	6 months	12 months			
	Very high infant mortality countries (IMR over 100)	**16**					**94**	**94**
1	Upper Volta	21	. .	. .	. .	17	94	95
2	Afghanistan	. .	. .	. .	. .	. .	97	73
3	Sierra Leone	. .	. .	94	83	26	81	89
4	Kampuchea	. .	. .	. .	. .	. .	45	88
5	Yemen Arab Rep.	. .	. .	80•	54•	17	96	76
6	Malawi	. .	. .	. .	95•[a]	36[b]	96	94
7	Guinea	18	. .	. .	. .	. .	87	77
8	Angola	19	. .	. .	. .	. .	81	83
9	Benin	. .	95•	90•	75•	17	96	103
10	Bhutan	. .	. .	. .	. .	. .	107	90
11	Central African Rep.	23	. .	. .	. .	. .	102	94
12	Chad	11	. .	. .	. .	. .	96	74
13	Ethiopia	13	. .	97•	95•	. .	85	76
14	Guinea-Bissau	9.0	. .	. .	. .	. .	83[c]	102
15	Liberia	. .	96	92	64	8	95	114
16	Mali	13	. .	. .	. .	. .	88	85
17	Nepal	. .	92	90	74	27	84	86
18	Somalia	. .	. .	. .	. .	. .	65	100
19	Mauritania	. .	. .	. .	. .	. .	77	97
20	Niger	. .	. .	. .	. .	. .	93	92
21	Rwanda	17	. .	. .	. .	26	104	88
22	Senegal	10	94	94	82	22	76	100
23	Yemen PDR	. .	85[d]	73[d]	58[d]	36	102	84
24	Bangladesh	50	98	97	89	53	94	84
25	Bolivia	. .	. .	. .	. .	. .	102	87
26	Congo	15	. .	91[a]•	62[a]•	. .	82	94
27	Lao, PDR	18	. .	. .	. .	. .	110	97
28	Nigeria	18	98•	94•	90•	. .	91	91
29	Oman	. .	. .	. .	. .	. .	. .	. .
30	Burundi	14	. .	95•	90•	39[e]	100	96
31	Egypt	14	. .	91•	84•	3	90	117
32	India	30	. .	. .	. .	. .	103	87
33	Ivory Coast	14	. .	. .	. .	. .	110	112
34	Pakistan	27	90	85	76	23	105	106
35	Sudan	17	91	86	72	. .	102	101
36	Turkey	. .	. .	97[a]•	. .	. .	112	122
37	Algeria	10	. .	. .	. .	. .	81	101
38	Cameroon	11	. .	98	97	5	101	105
39	Haiti	. .	93	85	72	18	89	96
40	Lesotho	15	93	89	75	11	86	107
41	Mozambique	. .	. .	. .	. .	. .	7[illegible]	70
42	Saudi Arabia	. .	. .	. .	. .	. .	[illegible]	120
43	Togo	. .	. .	99	90	9	9[illegible]	95
44	Zaire	16	. .	. .	. .	10	87	94
	High infant mortality countries (IMR 60 to 100)	**14**					**97**	**99**
45	Burma	20	90•	90•	90•	44[a]	102	113
46	Ghana	. .	. .	. .	. .	39	74	88
47	Indonesia	18	93	92	76	26	118	110
48	Iran	14	. .	. .	. .	. .	112	81
49	Libya	. .	. .	. .	. .	. .	141	147
50	Morocco	. .	95•	90•	. .	. .	81	110
51	Papua New Guinea	25	. .	. .	. .	52	97	9[illegible]
52	Tanzania	13	. .	. .	. .	. .	91	[illegible]
53	Tunisia	7.3	. .	92•	71•	3[e]	124	116
54	Uganda	10	85•	70•	20•	. .	86	83
55	Viet Nam	. .	. .	. .	. .	. .	112	90
56	Zambia	14	. .	. .	. .	. .	92	93
57	Honduras	. .	48•	28•	24•	10[f]	80	96
58	Nicaragua	. .	. .	. .	71[a]•	2[f]	87	99
59	Peru	9.0	80	70	53	. .	84	99
60	South Africa	15	. .	. .	. .	. .	104	118
61	Botswana	. .	. .	. .	97•	13	81[c]	94[c]
62	Brazil	8.7	75•	. .	48•	6[e]	125	109
63	Ecuador	. .	. .	. .	57[a]•	. .	97	88
64	El Salvador	13	. .	. .	. .	6[f]	104	99

		% of infants with low birth-weights 1979	% of mothers breast-feeding 1975-1980			Prevalence of wasting aged 12-23 months (% of age group) 1975-1979	Average index of food production per capita (1969-71 = 100)	Daily per capita calorie intak as % of requirement 1980
			3 months	6 months	12 months			
65	Iraq	6.1	..	..	..	..	89	111
66	Kenya	18	89	84	44	8	85	88
67	Dominican Rep.	15	66	47	26	7	99	105
68	Guatemala	18	..	84	74	7[f]	116	93
69	Jordan	7.3	79	70	41	9	74	96
70	Madagascar	10	..	..	80[g]	..	94	109
71	Zimbabwe	15	..	..	88[a]*		92	86
72	Colombia	10	62	42	23	2[h]	122	108
73	Syrian Arab Rep.	..	88	72	41	..	163	117
	Middle infant mortality countries (IMR 26 to 50)	**10**					**110**	**116**
74	Mexico	12	62	48	27	..	106	121
75	Mongolia	..	..	..	..	..	92	111
76	Philippines	20	78	69	53	16	122	116
77	Thailand	13	82	66	65	18	129	104
78	United Arab Emirates	..	..	..	..	..	..	..
79	Albania	..	..	..	..	..	106	110
80	Paraguay	..	80	77	49	..	111	134
81	Argentina	6.0	..	..	..	..	116	125
82	Guyana	..	64	48	2[i]	..	95[c]	109
83	Sri Lanka	21	88	82	60	22	148	102
84	Chile	13	..	..	..	..	97	114
85	China	6.0	..	..	..	..	116	107
86	Lebanon	12	..	..	..	..	109	100
87	Venezuela	11	50	40	30	..	104	112
88	Uruguay	10	87*	..	..	..	104	110
89	Mauritius	..	..	..	..	..	88[c]	119
90	Korea, Dem. Rep.	..	..	..	..	..	134	126
91	Korea, Rep. of	8.0	94[e]	92[e]	62[e]	..	126	128
92	Kuwait	..	..	..	..	..	..	..
93	Trinidad and Tobago	..	59	50	14	..	69	113
94	Yugoslavia	7.4	..	..	..	1[b]	117	140
95	Malaysia	9.0	47[e]	34[e]	19[e]	..	139	121
96	Panama	11	50	34	19	9[f]	102	103
97	Romania	..	..	..	..	..	147	126
98	Costa Rica	8.5	38	20	9	3[f]	110	116
99	Jamaica	10	57	40	16	..	90	119
100	Portugal	..	..	..	..	..	74	129
101	USSR	8.0	..	..	..	..	102	132
	Low infant mortality countries (IMR 25 and less)	**6.4**					**115**	**133**
102	Hungary	12	45	21	4	..	132	134
103	Poland	8.0	42	32	..	..	96	134
104	Bulgaria	..	..	..	..	..	116	146
105	Cuba	10	..	..	..	..	106	122
106	Greece	..	..	..	..	..	123	147
107	Czechoslovakia	6.1	..	..	..	..	114	141
108	Israel	6.3	..	..	..	..	103	118
109	Italy	11	..	..	..	1	112	150
110	Austria	5.8	..	..	..	..	112	135
111	Belgium	..	4	..	..	..	109	160
112	German Dem. Rep.	6.3	..	..	..	..	129	144
113	Germany, Fed. Rep.	6.7	..	..	..	..	110	133
114	New Zealand	4.9	..	..	..	..	107	126
115	USA	7.4	33[j]	25[k]	8	..	116	139
116	Ireland	..	..	..	..	..	115	148
117	Singapore	11	..	..	..	..	148	134
118	United Kingdom	7.0	..	..	..	..	122	132
119	Australia	5.8	..	..	..	..	117	117
120	Canada	6.4	26	13	..	..	109	127
121	France	6.5	9	..	..	(.)	117	134
122	Hong Kong	8.0	..	18[e]	..	..	71	128
123	Spain	..	..	..	..	..	125	135
124	Denmark	6.4	..	..	..	..	111	133
125	Netherlands	4.0	17	..	..	..	116	131
126	Norway	4.2	..	..	..	..	117	124
127	Switzerland	..	..	..	..	..	119	133
128	Finland	3.9	..	..	..	..	103	118
129	Japan	5.1	56[l]	..	..	..	91	124
130	Sweden	3.6	35[m]	14[m]	..	..	117	119

TABLE 3: HEALTH

		% of population with access to drinking water 1980		% of one year old children fully immunized 1980				% of pregnant women fully immunized against tetanus 1980	Life expectancy at birth (years)	
		urban	rural	TB	DPT	Polio	Measles		1960	1981
	Very high infant mortality countries (IMR over 100)	**69**	**20**	**32**	**17**	**10**	**17**		**37**	**47**
1	Upper Volta	27	31	16	2	2	23	11	37	44
2	Afghanistan	28	8	8	3	3	6	3[a]	33	37
3	Sierra Leone	50	2	30	12	10	23	..	37	47
4	Kampuchea	..	..	..	..	..	..	..	46	39
5	Yemen Arab Rep.	100	18	15	3	3	4	0[a]	36	43
6	Malawi	77	37	86	66	68	65	..	27	44
7	Guinea	69	2	..	..	..	..	..	35	43
8	Angola	85	10	47*	9*	7*	17*	..	33	42
9	Benin	26	15	37*	20*	45*	6*	..	37	50
10	Bhutan	50	5	9	4	4	18	0	38	45
11	Central African Rep.	16[b]		..	..	..	..	..	35	43
12	Chad	26[b]		..	..	..	..	..	35	43
13	Ethiopia	80*	5*	10	6	6	7	..	36	46
14	Guinea-Bissau	18	8	..	..	..	..	..	32	37
15	Liberia	20[b]		87	39	26	100	60	44	54
16	Mali	37	0	19	..	..	..	1	37	45
17	Nepal	83	7	43	17	3	2	27	38	45
18	Somalia	20*	42*	3	2	2	3	5[a]	35	39
19	Mauritania	80	85	57	18	18	45	1	37	44
20	Niger	41	32	28	6	6	19	3	37	45
21	Rwanda	48	55	51	17	15	42	5	37	46
22	Senegal	77	25	..	..	..	..	..	37	44
23	Yemen PDR	85	25	9	5	5	6	3[a]	36	46
24	Bangladesh	26	45	1	2	2	2	1	37	48
25	Bolivia	69	10	..	10	10	14[h]	..	43	51
26	Congo	40*	8*	92	42	42	49	..	48	60
27	Lao. PDR	20*	2*	4	..	..	..	..	40	43
28	Nigeria	68*	18*	23	24*	24*	55	11	39	49
29	Oman	..	..	60	11	11	7	27[a]	38	49
30	Burundi	90	20	65	38	6	30	..	37	45
31	Egypt	88	64	62	70	72	59	10[a]	46	57
32	India	77	31	14	35	11	(.)	17	43	52
33	Ivory Coast	19[b]		..	..	..	..	..	37	47
34	Pakistan	72	20	9	3	3	3	1[a]	43	50
35	Sudan	40[b]*		2	1	1	1	1[a]	40	47
36	Turkey	95	62	47	64	69	52	..	51	62
37	Algeria	77[b]		59	33	30	17	..	47	56
38	Cameroon	35*	41*	8	5	5	16	..	37	50
39	Haiti	14[b]		57*	29*	7*	..	..	44	54
40	Lesotho	37	11	81	56	54	49	..	42	52
41	Mozambique	..	..	..	..	..	..	..	37	49
42	Saudi Arabia	92	87	43	25	34	10	0[a]	43	55
43	Togo	70	31	..	..	..	..	..	42	48
44	Zaire	16[b]		34	18	18	20	..	40	50
	High infant mortality countries (IMR 60 to 100)	**85**	**21**	**51**	**35**	**37**	**34**		**47**	**57**
45	Burma	38	15	20	8	2	0	9	44	54
46	Ghana	72	33	..	..	..	..		45	54
47	Indonesia	35	19	54	23[e]	1	(.)	12	41	54
48	Iran	51[b]		5	26	43	44	2[a]	50	58
49	Libya	100	90	60	60	60	62	7[a]	47	57
50	Morocco	100	..	50*	44	44	..	..	47	57
51	Papua New Guinea	55	10	51	25	25	..	..	41	51
52	Tanzania	85*	41*	84	58	56	82	35	42	52
53	Tunisia	100	17	65	36	37	65	2[a]	48	61
54	Uganda	35[b]		18	9	8	22	20	41	48
55	Viet Nam	..	32	..	..	..	..	..	43	63
56	Zambia	42[b]		42*	71*	21*	72*	..	40	51
57	Honduras	50	40	42	36	37	35[h]	11	46	59
58	Nicaragua	91	10	50	18	18	15	31*	47	57
59	Peru	68	15*	56	17	17	23[h]	4	47	58
60	South Africa	..	..	..	..	..	..		53	63
61	Botswana		..	91	70	45	63	32	40	57
62	Brazil	80	3*	56*	53	95*	72[h]	..	55	64
63	Ecuador	82	16	57	18	19	22[h]	4	51	62
64	El Salvador	67	40	55	52[e]	47[e]	58	..	51	63

		% of population with access to drinking water 1980		% of one year old children fully immunized 1980				% of pregnant women fully immunized against tetanus 1980	Life expectancy at birth (years)	
		urban	rural	TB	DPT	Polio	Measles		1960	1981
65	Iraq	62[b]		76	13	16	33	4[a]	46	57
66	Kenya	85	15	. .	. .	. .	. .	. .	41	56
67	Dominican Rep.	85	33	34	27	42	17[h]	26	51	62
68	Guatemala	89	21•	30	58•	58•	45•	. .	47	59
69	Jordan	100	65	0	44	44	11	2[a]	47	62
70	Madagascar	25[b]		13	35	3	. .	. .	37	48
71	Zimbabwe	. .	10•	64	39	38	56	. .	49	55
72	Colombia	100	79	57	20	22	26	6	53	63
73	Syrian Arab Rep.	98	54	39	15	15	17	3[a]	50	65
	Middle infant mortality countries (IMR 26 to 50)	**91**	**50**	**70**	**56**	**67**	**52**		**60**	**69**
74	Mexico	64	43	13	10	31	12[h]	. .	57	66
75	Mongolia	. .	. .	50	75	86	96	0	52	64
76	Philippines	65	43	61	51[e]	44	22•	. .	53	63
77	Thailand	65	63	77	56[e]	35	0	29	52	63
78	United Arab Emirates	95	81	15	11	11	34	. .	47	63
79	Albania	. .	. .	93	94	92	90	. .	62	70
80	Paraguay	39	10	25	23	26	25	6	56	65
81	Argentina	65	16•	59	45	89	65	. .	65	71
82	Guyana	100	60	. .	45	40	. .	. .	61	70
83	Sri Lanka	65	18	63	77	75	0	41	62	69
84	Chile	100	20•	98	91	90[e]	89	. .	57	68
85	China	. .	. .	. .	. .	. .	. .	. .	41	67
86	Lebanon	. .	. .	. .	. .	. .	. .	. .	58	66
87	Venezuela	91	50	. .	. .	. .	. .	. .	57	68
88	Uruguay	96	13•	83	62	67[e]	55[h]	11	68	71
89	Mauritius	100	98	98	97	97	33•	1	59	65
90	Korea, Dem. Rep.	. .	. .	. .	. .	. .	. .	. .	54	66
91	Korea, Rep. of	86	61	42	61	62	5[h]	. .	54	66
92	Kuwait	89[b]		0	54	76	66	30[a]	60	70
93	Trinidad and Tobago	100	93	. .	52	46	. .	. .	64	72
94	Yugoslavia	. .	. .	100	90	95	95[h]	. .	63	71
95	Malaysia	90	49	77	47	55	. .	. .	53	65
96	Panama	100	65	76	49	50	52	. .	62	71
97	Romania	. .	. .	. .	. .	. .	. .	. .	65	71
98	Costa Rica	100	. .	82	84	87	52	. .	62	73
99	Jamaica	86[b]		. .	39	37	. .	. .	64	71
100	Portugal	65[b]		. .	90	85	70[h]	. .	63	72
101	USSR	. .	. .	. .	95	95	95[h]	. .	68	72
	Low infant mortality countries (IMR 25 and less)			**90**	**85**	**92**	**70**		**70**	**74**
102	Hungary	. .	. .	100	100	98	99[h]	. .	68	71
103	Poland	. .	. .	95	95	95	65	. .	67	73
104	Bulgaria	. .	. .	97	97	98	98	98	69	73
105	Cuba	. .	. .	99	100	. .	56	. .	63	73
106	Greece	. .	. .	12	31	95	. .	. .	69	74
107	Czechoslovakia	. .	. .	95	95	95	95[h]	. .	70	72
108	Israel	. .	. .	65	73	73	69	. .	69	73
109	Italy	. .	. .	. .	. .	. .	. .	. .	69	74
110	Austria	. .	. .	90	90	90	90[h]	. .	69	73
111	Belgium	. .	. .	. .	95	99	50	. .	70	73
112	German Dem. Rep.	. .	. .	95	80	90	95	. .	69	73
113	Germany, Fed. Fep.	. .	. .	40	50	80	35[h]	. .	70	73
114	New Zealand	. .	. .	. .	. .	. .	80[h]	. .	72	74
115	USA	. .	. .	. .	. .	. .	96[h]	. .	70	75
116	Ireland	. .	. .	. .	33	65	. .	. .	70	73
117	Singapore	100	. .	85	81	88	58[h]	. .	64	72
118	United Kingdom	. .	. .	. .	35	79	50[h]	. .	71	74
119	Australia	. .	. .	. .	33	17	. .	. .	71	74
120	Canada	. .	. .	. .	. .	. .	. .	. .	71	75
121	France	. .	. .	80	79	80	. .	. .	70	76
122	Hong Kong	100	95	100	84	94	. .	. .	67	75
123	Spain	. .	. .	. .	. .	. .	. .	. .	68	74
124	Denmark	. .	. .	. .	85	97	. .	. .	72	75
125	Netherlands	. .	. .	. .	95	95	91[h]	. .	73	76
126	Norway	. .	. .	. .	. .	. .	. .	. .	73	76
127	Switzerland	. .	. .	. .	. .	. .	. .	. .	71	76
128	Finland	. .	. .	90	92	90	70[h]	. .	68	75
129	Japan	. .	. .	85	. .	. .	69[h]	. .	68	77
130	Sweden	. .	. .	. .	100[i]	100	56[h]	. .	73	77

TABLE 4: EDUCATION

		Adult literacy rate				Primary school enrolment ratio				Secondary school enrolment ratio 1979–1981	
		1970		1980		1960		1979–1981			
		male	female	male	female	male	female	male	female	male	female
	Very high infant mortality countries (IMR over 100)	**28**	**9**	**42**	**19**	**41**	**16**	**81**	**49**	**16**	**8**
1	Upper Volta	13	3	18	5	12	5	24	14	4	2
2	Afghanistan	13	2	26	6	15	2	49	11	12	4
3	Sierra Leone	18	8	31	17	30	15	45[a]	30[a]	16[e]	8[e]
4	Kampuchea	71	23	78	39	82	46	48[b]	35[b]	13[b]	6[b]
5	Yemen Arab Rep	9	1	18	2	14	(.)	82	12	9	2
6	Malawi	42	18	48	25	81	45	70	49	6	2
7	Guinea	21	7	35	14	44	16	44	22	23	9
8	Angola	16	7	36	19	28	13	85[b]	48[b]	10[b]	8[b]
9	Benin	23	8	40	17	38	15	84	39	23	8
10	Bhutan	..	..	..	..	5	(.)	15	7	2	1
11	Central African Rep.	26	6	48	19	53	12	89	49	20	7
12	Chad	20	2	35	8	29	4	51[c]	19[c]	6[c]	1[c]
13	Ethiopia	9	4	11[d]	5[d]	11	3	56	30	14	8
14	Guinea-Bissau	13	6	25	13	35	15	130	59	13	3
15	Liberia	27	8	42	18	45	18	82	50	29	11
16	Mali	11	4	19	8	14	6	35[e]	20[e]	13[a]	5[a]
17	Nepal	23	3	34	6	19	1	126	53	33	9
18	Somalia	5	1	11	3	13	5	38	21	16	6
19	Mauritania	..	..	..	..	13	3	43	23	16	4
20	Niger	6	2	14	6	7	3	29[e]	17[e]	5[e]	2[e]
21	Rwanda	43	21	61	39	68	30	74	67	2	1
22	Senegal	18	5	31	14	36	17	58	38	14	6
23	Yemen, PDR	31	9	48	16	20	5	93[a]	51[a]	42[a]	15[a]
24	Bangladesh	36	12	43	20	66	26	76	47	24	6
25	Bolivia	68	46	79	58	78	50	90	78	41	31
26	Congo	50	19	70	44	..	..	..	..	..	..
27	Lao, PDR	37	28	51	36	34	16	105	89	22	14
28	Nigeria	35	14	46	23	46	27	94[a]	70[a]	13[e]	7[e]
29	Oman	..	..	..	..	..	..	81	43	20	7
30	Burundi	29	10	39	15	27	9	34	22	4	2
31	Egypt	50	20	56	28	80	52	89	63	64	39
32	India	47	20	55	29	80	40	86	57	40	20
33	Ivory Coast	26	10	45	24	68	24	92	60	25	8
34	Pakistan	30	11	39	18	46	13	73	30	22	8
35	Sudan	28	6	38	14	35	14	60	43	20	12
36	Turkey	69	35	80	50	90	58	110	93	49	24
37	Algeria	39	11	60	24	55	37	106	81	40	26
38	Cameroon	47	19	62	36	87	43	117	97	25	13
39	Haiti	26	17	34	24	50	42	75	64	14	12
40	Lesotho	49	74	58	81	63	102	84	123	13	20
41	Mozambique	29	14	44	23	60	36	102	78	9	4
42	Saudi Arabia	15	2	35	12	22	2	77	51	37	24
43	Togo	30	8	46	20	63	24	144	89	51	16
44	Zaire	61	22	74	37	88	32	104[e]	75[e]	33[e]	13[e]
	High infant mortality countries (IMR 60 to 100)	**58**	**37**	**68**	**55**	**68**	**45**	**105**	**97**	**29**	**23**
45	Burma	..	..	..	..	61	52	87[a]	81[a]	22[a]	18[a]
46	Ghana	45	20	59	37	52	25	77	60	44	27
47	Indonesia	66	42	77	58	86	58	119	104	33	22
48	Iran	40	17	55	30	56	27	121[a]	80[a]	55[a]	32[a]
49	Libya	60	13	76	36	92	24	..	..	..	..
50	Morocco	33	11	41	18	67	27	95	58	29	18
51	Papua New Guinea	32	19	48	30	59	7	70	54	16	7
52	Tanzania	48	18	53[d]	23[d]	33	18	110	98	5	2
53	Tunisia	44	17	61	34	88	43	119	92	37	23
54	Uganda	52	30	65	41	65	32	58	42	7	3
55	Viet Nam	..	..	..	..	..	..	120	105	53	43
56	Zambia	66	37	79	58	51	34	101	89	22	11
57	Honduras	55	50	64	62	68	67	96	95	29	30
58	Nicaragua	58	56	61[d]	60[d]	65	66	97	103	40	47
59	Peru	81	60	89	73	95	71	116	108	62	52
60	South Africa	70	71	81	81	94	85	105[b]	105[b]	20[b]	19[b]
61	Botswana	41	43	61	61	35	48	92	111	20	23
62	Brazil	69	63	76	73	97	93	93	93	29[e]	35[e]
63	Ecuador	75	68	82	76	87	79	109	105	39	42
64	El Salvador	61	53	70	63	82	77	74	74	24	23

		Adult literacy rate				Primary school enrolment ratio				Secondary scho enrolment rati	
		1970		1980		1960		1979-1981		1979-1981	
		male	female	male	female	male	female	male	female	male	fema
65	Iraq	50	18	68	32	94	36	122	110	76	38
66	Kenya	44	19	60	35	64	30	116	103	23	15
67	Dominican Rep.	69	66	75	73	99	98	105	107	32[e]	33
68	Guatemala	51	37	59	44	50	39	74	63	17	15
69	Jordan	64	29	78	53	94	59	105[h]	102[h]	79[h]	73
70	Madagascar	56	43	68	55	58	45	100[d]	87[d]	13[d]	10
71	Zimbabwe	63	47	77	61	. .	. .	118	113	18	13
72	Colombia	79	76	86	84	77	77	127	130	43	49
73	Syrian Arab Rep.	59	21	72	35	89	39	112	87	57	35
	Middle infant mortality countries (IMR 26 to 50)	**85**	**75**	**90**	**85**	**100**	**94**	**107**	**104**	**54**	**59**
74	Mexico	78	69	86	80	82	77	121	115	54	49
75	Mongolia	87	74	93	86	79	78	107	102	85	92
76	Philippines	83	80	90	88	98	93	111	108	58	68
77	Thailand	86	72	93	83	88	79	85[a]	80[a]	30[e]	26
78	United Arab Emirates	24	7	30	19	. .	. .	117	115	49	57
79	Albania	. .	. .	. .	. .	102	86	109	103	70	60
80	Paraguay	84	75	90	83	105	90	106	98	26	26
81	Argentina	94	92	95	94	98	99	116	116	52	60
82	Guyana	94	88	96	93	107	106	96	95	58	61
83	Sri Lanka	85	69	87	76	100	90	106	100	49	54
84	Chile	90	86	94	91	111	107	118	116	51	59
85	China	. .	. .	. .	. .	. .	. .	132	110	52	35
86	Lebanon	74	52	83	64	105	99	123	114	60	56
87	Venezuela	79	71	84	78	100	100	104	104	35	42
88	Uruguay	93	93	95	95	111	111	107	104	56	65
89	Mauritius	77	59	86	72	103	93	103	102	51	50
90	Korea, Dem. Rep.	. .	. .	. .	. .	. .	. .	118[c]	114[c]	. .	. .
91	Korea, Rep. of	92	78	96	88	99	89	108	105	89	80
92	Kuwait	65	42	72	54	131	102	98	93	80	70
93	Trinidad and Tobago	95	89	97	94	89	87	93[a]	95[a]	55[c]	57
94	Yugoslavia	89	74	93	81	113	108	100	98	86	80
95	Malaysia	71	48	79	61	108	83	94	91	54	51
96	Panama	81	81	87	86	98	94	115	111	61	69
97	Romania	96	91	97	94	101	95	101	101	74	70
98	Costa Rica	88	87	92	92	97	95	109	106	44	51
99	Jamaica	84	89	90	93	92	93	98	100	54	60
100	Portugal	76	66	85	76	132	129	120[e]	116[e]	54[a]	56
101	USSR	98	97	[illegible]	98	100	100	97[d]	97[d]	93[d]	119
	Low infant mortality countries (IMR 25 and less)	**95**	**91**	**96**	**94**	**105**	**103**	**100**	**101**	**82**	**84**
102	Hungary	98	98	99	98	103	100	97	97	33	47
103	Poland	98	97	99	98	110	107	100	99	75	80
104	Bulgaria	94	89	96	93	94	92	97	96	86	85
105	Cuba	86	87	91	91	109	109	113	105	73	80
106	Greece	90	76	94	83	104	101	103	102	86	76
107	Czechoslovakia	. .	. .	. .	. .	93	93	91	92	33	56
108	Israel	92	85	96	91	99	97	94	96	67	78
109	Italy	95	93	96	95	112	109	102	101	75	71
110	Austria	. .	. .	. .	. .	106	104	100	99	73	76
111	Belgium	99	99	99	99	111	108	101	101	88	89
112	German Dem. Rep.	. .	. .	. .	. .	111	113	95	97	91	84
113	Germany, Fed. Rep.	. .	. .	99		. .	. .	. .	. .	. .	. .
114	New Zealand	. .	. .	99		110	106	103	101	80	82
115	USA	99	99	99	99	. .	. .	. .	. .	. .	. .
116	Ireland	. .	. .	98		107	112	101	102	88	98
117	Singapore	82	55	88	70	121	101	108	105	53	58
118	United Kingdom	. .	. .	99		92	92	104	105	81	84
119	Australia	. .	. .	100		103	103	110	110	85	88
120	Canada	. .	. .	99		108	105	100	100	88	90
121	France	99	98	99	99	144	143	112	111	81	89
122	Hong Kong	90	64	94	77	93	79	111	107	60	65
123	Spain	93	87	96	91	106	116	109	109	84	87
124	Denmark	. .	. .	99		103	103	97	97	106	105
125	Netherlands	. .	. .	99		105	104	100	102	96	91
126	Norway	. .	. . .	99		100	100	99	100	92	95
127	Switzerland	. .	. .	99		118	118	86[e]	87[e]	52[e]	57
128	Finland	. .	. .	100		100	95	83	83	85	95
129	Japan	99	99	99	99	103	102	101	101	91	92
130	Sweden	. .	. .	99		95	96	97	97	82	90

TABLE 5: DEMOGRAPHIC INDICATORS

		Infant mortality rate aged 0–1		Child death rate aged 1–4		Crude death rate		Crude birth rate		Total fertility rate	Population annual growth rate
		1960	1981	1960	1981	1960	1981	1960	1981	1981	1970–1981
	Very high infant mortality countries (IMR over 100)	**180**	**140**	**41**	**26**	**27**	**19**	**48**	**46**	**6.5**	**2.6**
1	Upper Volta	250	210	63	50	27	22	49	48	6.5	2.0
2	Afghanistan	230	200	41	35	31	26	50	47	6.9	2.5
3	Sierra Leone	230	200	57	49	27	18	47	46	6.1	2.6
4	Kampuchea	150	190	22		19	23	45	41	4.8	−0.3[a]
5	Yemen Arab Rep	210	190	60	50	29	23	50	48	6.8	3.0
6	Malawi	210	170	49	38	27	23	56	56	7.8	3.0
7	Guinea	210	160	50	36	30	22	47	47	6.3	2.9
8	Angola	210	150	50	33	31	23	50	49	6.5	2.5
9	Benin	210	150	49	33	27	17	51	49	6.5	2.7
10	Bhutan	200	150	33	22	26	19	43	40	5.7	2.0
11	Central African Rep.	200	150	46	32	28	22	43	43	5.5	2.3
12	Chad	200	150	46	32	29	22	45	43	5.5	2.0
13	Ethiopia	180	150	40	31	28	24	51	48	6.5	2.0
14	Guinea-Bissau	190	150	..		32	22	41	41	5.4	1.6[a]
15	Liberia	190	150	46	33	21	14	50	50	6.9	3.5
16	Mali	200	150	46	33	27	21	50	49	6.5	2.6
17	Nepal	200	150	33	22	26	20	44	44	6.4	2.6
18	Somalia	180	150	40	31	29	25	48	48	6.5	2.8
19	Mauritania	190	140	43	30	27	20	51	44	6.0	2.3
20	Niger	190	140	45	31	27	21	52	51	7.0	3.3
21	Rwanda	150	140	32	29	27	20	53	54	8.3	3.4
22	Senegal	180	140	42	31	26	21	48	48	6.5	2.7
23	Yemen, PDR	210	140	59	29	29	20	50	48	7.0	2.5
24	Bangladesh	160	130	25	20	28	18	54	47	6.4	2.6
25	Bolivia	170	130	40	23	22	16	46	42	6.0	2.6
26	Congo	170	130	39	26	18	10	40	43	6.0	2.9
27	Lao, PDR	160	130	24	18	23	21	44	43	6.4	1.9
28	Nigeria	180	130	42	28	25	17	52	50	6.9	2.5
29	Oman	190	130			28	17	51	48	7.1	3.1[a]
30	Burundi	150	120	33	24	27	20	47	46	6.5	2.2
31	Egypt	170	120	34	16	19	12	44	36	4.8	2.5
32	India	170	120	26	17	22	13	44	35	4.8	2.1
33	Ivory Coast	170	120	39	25	27	18	49	46	6.8	5.0
34	Pakistan	160	120	25	17	24	16	51	46	6.4	3.0
35	Sudan	170	120	40	21	25	18	47	47	6.7	3.1
36	Turkey	190	120	50	20	16	9	43	[illegible]	4.6	2.3
37	Algeria	170	110	39	18	23	13	50	45	7.3	3.3
38	Cameroon	160	110	36	20	27	17	43	43	5.8	2.2
39	Haiti	180	110	47	17	19	13	39	33	4.7	1.7
40	Lesotho	140	110	31	22	23	15	42	42	5.8	2.4
41	Mozambique	160	110	36	22	26	17	46	[illegible]	6.5	4.2
42	Saudi Arabia	190	110	48	17	23	13	49	45	7.3	4.5
43	Togo	180	110	42	20	23	18	51	49	6.5	2.5
44	Zaire	150	110	33	21	24	16	48	46	6.3	3.0
	High infant mortality countries (IMR 60 to 100)	**140**	**90**	**27**	**11**	**20**	**11**	**48**	**44**	**6.1**	**3.0**
45	Burma	160	100	25	12	21	13	43	37	5.2	2.2
46	Ghana	140	100	31	19	20	13	50	49	7.0	3.0
47	Indonesia	150	100	23	14	22	13	46	35	4.4	2.3
48	Iran	160	100	26	14	17	11	46	43	6.0	3.1
49	Libya	160	100	36	12	19	12	49	47	7.4	4.1
50	Morocco	160	100	37	15	23	13	52	46	6.9	3.1
51	Papua New Guinea	170	100	26	13	23	15	44	36	5.2	2.1
52	Tanzania	150	100	33	19	22	15	47	47	6.5	3.4
53	Tunisia	110	100	36	9	21	9	49	34	5.1	2.3
54	Uganda	140	100	29	17	23	18	50	50	7.0	2.6
55	Viet Nam	160	100	25	12	21	8	47	35	5.1	2.8
56	Zambia	150	100	33	20	24	16	51	49	6.9	3.1
57	Honduras	150	90	30	9	19	11	51	44	6.6	3.4
58	Nicaragua	140	90	30	10	19	11	51	44	6.1	3.9
59	Peru	160	90	38	9	18	11	46	36	5.1	2.6
60	South Africa	140	90	28	17	15	9	39	39	5.1	2.8
61	Botswana	120	80	..	..	25	13	50	50	6.5	2.6[a]
62	Brazil	120	80	19	7	13	8	43	30	4.0	2.1
63	Ecuador	140	80	28	8	17	9	47	40	5.9	3.4
64	El Salvador	140	80	26	7	16	8	49	40	5.6	2.9

		Infant mortality rate aged 0–1		Child death rate aged 1–4		Crude death rate		Crude birth rate		Total fertility rate 1981	Populat annu growth 1970–1
		1960	1981	1960	1981	1960	1981	1960	1981		
65	Iraq	140	80	28	7	20	12	49	47	7.0	3.4
66	Kenya	140	80	29	15	24	13	55	55	8.0	4.0
67	Dominican Rep.	120	70	20	5	16	8	50	36	4.6	3.0
68	Guatemala	90	70	10	5	18	10	48	39	5.3	3.1
69	Jordan	140	70	26	5	20	9	47	46	7.3	3.5
70	Madagascar	110	70	21	11	27	18	47	47	6.5	2.6
71	Zimbabwe	120	70	23	11	17	13	55	54	8.0	3.2
72	Colombia	100	60	14	4	16	8	46	29	3.7	1.9
73	Syrian Arab Rep.	130	60	25	4	18	8	47	47	7.4	3.7
	Middle infant mortality countries (IMR 26 to 50)	**80**	**40**	**9**	**2**	**11**	**7**	**42**	**29**	**3.7**	**2.0**
74	Mexico	90	50	10	4	12	7	45	36	5.0	3.1
75	Mongolia	110	50	14	4	15	7	41	34	4.9	2.9
76	Philippines	110	50	14	4	15	7	47	34	4.6	2.7
77	Thailand	100	50	13	4	15	8	44	30	3.9	2.5
78	United Arab Emirates	140	50	26	3	19	7	46	30	6.8	16.6
79	Albania	80	46	9	..	10	6	43	29	3.8	2.5
80	Paraguay	90	46	9	2	13	7	43	32	4.3	2.6
81	Argentina	60	44	4	2	9	9	24	20	2.8	1.6
82	Guyana	70	43	..	..	10	6	46	29	3.5	2.2
83	Sri Lanka	70	43	7	3	9	6	36	27	3.5	1.7
84	Chile	110	42	18	2	12	7	37	25	3.0	1.7
85	China	170	41	26	7	24	8	39	21	2.9	1.5
86	Lebanon	70	40	5	2	14	8	43	30	4.0	0.6
87	Venezuela	90	40	9	2	11	6	46	35	4.4	3.4
88	Uruguay	50	39	3	2	10	10	22	20	2.8	0.4
89	Mauritius	70	34	..	..	9	6	41	26	2.9	1.4
90	Korea, Dem. Rep.	80	33	9	2	13	6	42	31	4.2	2.6
91	Korea, Rep. of	80	33	9	2	13	7	43	24	3.0	1.7
92	Kuwait	90	33	10	1	10	4	44	38	5.9	6.3
93	Trinidad and Tobago	50	31	4	1	8	8	38	29	2.5	1.4
94	Yugoslavia	90	31	11	2	10	9	24	17	2.2	0.9
95	Malaysia	70	30	7	2	16	7	45	31	4.0	2.5
96	Panama	70	29	5	1	10	5	41	30	3.8	2.3
97	Romania	80	29	8	2	9	10	19	18	2.5	0.9
98	Costa Rica	80	27	8	1	10	4	47	30	3.5	2.8
99	Jamaica	50	27	3	(.)	9	6	39	29	3.8	1.5
100	Portugal	80	26	9	1	11	10	24	16	2.3	0.8
101	USSR	33	26	2	..	7	10	25	19	2.4	0.9
	Low infant mortality countries (IMR 25 and less)	**31**	**12**	**2**	**(.)**	**9**	**9**	**18**	**14**	**1.9**	**0.7**
102	Hungary	48	21	2	1	10	14	15	13	1.9	0.4
103	Poland	60	21	5	1	8	9	23	19	2.2	0.9
104	Bulgaria	45	20	3	1	8	11	18	14	2.1	0.5
105	Cuba	70	19	5	1	9	6	32	18	2.2	1.1
106	Greece	40	18	3	1	7	9	19	15	2.3	0.9
107	Czechoslovakia	24	17	1	1	9	12	16	16	2.4	0.7
108	Israel	31	16	2	1	6	7	27	25	3.3	2.6
109	Italy	44	14	3	1	10	10	18	11	1.9	0.4
110	Austria	38	13	3	1	13	12	18	13	1.6	0.1
111	Belgium	31	12	2	(.)	12	11	17	13	1.7	0.2
112	German Dem. Rep.	39	12	3	(.)	14	14	17	14	1.4	−0.2
113	Germany, Fed. Rep.	34	12	2	1	12	12	18	10	1.4	0.0
114	New Zealand	23	12	1	(.)	9	8	27	16	2.1	1.5
115	USA	26	12	1	(.)	10	9	24	16	1.8	1.0
116	Ireland	29	11	2	(.)	12	9	21	21	3.2	1.3
117	Singapore	36	11	2	(.)	8	5	38	18	1.7	1.5
118	United Kingdom	23	11	1	(.)	12	12	18	13	1.7	0.1
119	Australia	20	10	1	(.)	9	7	22	16	1.9	1.4
120	Canada	27	10	2	(.)	8	7	27	16	1.9	1.2
121	France	27	10	2	(.)	11	10	18	15	1.9	0.5
122	Hong Kong	37	10	2	(.)	8	5	35	19	2.2	2.4
123	Spain	50	10	4	(.)	9	8	22	14	2.5	1.1
124	Denmark	22	8	1	(.)	10	11	17	10	1.6	0.3
125	Netherlands	18	8	1	(.)	8	8	21	13	1.6	0.8
126	Norway	19	8	1	(.)	9	10	17	13	1.8	0.5
127	Switzerland	21	8	1	(.)	10	9	18	12	1.5	0.1
128	Finland	21	7	1	(.)	9	9	19	13	1.6	0.4
129	Japan	30	7	2	(.)	8	6	17	13	1.7	1.1
130	Sweden	17	7	1	(.)	10	11	14	11	1.7	0.3

TABLE 6: ECONOMIC INDICATORS

		GNP per capita (US $) 1981	GNP per capita average annual growth rate (%) 1960–1981	Rate of inflation (%) 1970–1981	% of population below absolute poverty level 1977–1981		% population urbanised		Annual growth rate of urban population (%) 1970–1981	ODA inflow (million US $) 1981	ODA as % of recipient GNP (million US $) 1981
					urban	rural	1960	1981			
	Very high infant mortality countries (IMR over 100)	**320**	**1.4**	**11.4**			**11**	**21**	**5.7**	**12031T**	**8**
1	Upper Volta	240	1.1	9.5	..	..	5	11	6.0	217	15
2	Afghanistan	170[a]	0.5[b]	5.0	18	36	8	16	5.8	23	0.9[c]
3	Sierra Leone	320	0.4	12.2	..	65	13	22	4.4	61	5
4	Kampuchea	70[d]	−2.7[e]	..	..	..	11	15	1.5[f]	130	23[g]
5	Yemen Arab Rep.	460	5.5	15.6	..	..	3	11	8.2	363	11
6	Malawi	200	2.7	10.3	25	85	4	10	7.0	138	11
7	Guinea	300	0.2	4.6	..	..	10	20	6.0	82	5
8	Angola	490	−2.3[h]	..	..	..	10	22	5.8	61	2[i]
9	Benin	320	0.6	9.4	..	65	10	15	4.1	82	7
10	Bhutan	80	0.1	..	..	..	2	4	4.4	10	9
11	Central African Rep.	320	0.4	12.6	..	..	23	29	4.8[f]	102	13
12	Chad	110	−2.2	7.4	30	56	7	19	6.5	60	12
13	Ethiopia	140	1.4	4.1	60[i]	65[i]	6	14	5.5	241	5
14	Guinea-Bissau	190	2.9[k]	7.2	..	..	13	17	4.4[f]	65	43
15	Liberia	520	1.2	8.9	23	..	20	34	5.7	109	11
16	Mali	190	1.3	9.7	27[j]	48[j]	11	19	4.6	230	17
17	Nepal	150	0.0	9.3	55	61	3	6	5.0	181	8
18	Somalia	280	−0.2	12.6	40	70	17	31	5.4	359	29
19	Mauritania	460	1.5	9.0	..	..	3	24	8.1	187	26
20	Niger	330	−1.6	12.2	..	35[j]	6	13	7.2	201	11
21	Rwanda	250	1.7	13.4	30	90[j]	2	4	6.4	154	11
22	Senegal	430	−0.3	7.9	..	..	23	34	3.7	400	16
23	Yemen, PDR	460	12.1[h]	..	..	20	28	37	3.8	97	11
24	Bangladesh	140	0.3	15.7	86	86	5	12	6.5	1096	9
25	Bolivia	600	1.9	23.0	..	..	24	45	6.9	170	5
26	Congo	1,110	1.0	11.8	..	..	30	46	4.4	70	4
27	Lao, PDR	80	1.8[o]	..	..	..	8	14	5.2	35	12
28	Nigeria	870	3.5	14.2	..	..	13	21	4.8	41	0.1
29	Oman	5,920	8.3	27.2	..	..	4	7	6.8[f]	237	4
30	Burundi	230	2.4	11.6	55	85	2	2	2.7	122	12
31	Egypt	650	3.5	11.1	21	25	38	44	2.9	1293	5
32	India	260	1.4	8.1	40	51	18	24	3.7	1902	1
33	Ivory Coast	1,200	2.3	13.0	..	..	19	41	8.3	124	1
34	Pakistan	350	2.8	13.1	32	29	22	29	4.3	768	3
35	Sudan	380	−0.3	15.9	..	85[j]	10	26	7.1	680	9
36	Turkey	1,540	3.5	32.7	..	..	30	47	4.1	735	1
37	Algeria	2,140	3.2	13.4	20	..	30	44	5.6	165	0.4
38	Cameroon	880	2.8	10.6	15	40	14	36	7.4	201	3
39	Haiti	300	0.5	10.0	55	78	16	28	4.7	107	7
40	Lesotho	540	7.0	10.5	50	55	2	12	16.1	101	14
41	Mozambique	230	−0.1[h]	..	..	..	4	9	8.2	144	5[i]
42	Saudi Arabia	12,600	7.8	24.3	..	..	30	68	7.4	30	(.)
43	Togo	380	2.5	8.9	42	..	10	21	6.6	63	6
44	Zaire	210	−0.1	35.3	..	80[j]	16	36	7.5	394	6
	High infant mortality countries (IMR 60 to 100)	**870**	**2.5**	**11.8**			**29**	**41**	**4.7**	**7425T**	**3**
45	Burma	190	1.4	10.7	40	40	19	28	3.9	284	4
46	Ghana	400	−1.1	36.4	..	..	23	37	5.0	145	3
47	Indonesia	530	4.1	20.5	28	51	15	21	4.0	975	1
48	Iran	2,160[p]	7.9[q]	20.1	..	..	34	51	5.0	9	(.)[r]
49	Libya	8,450	4.7	17.3	..	..	23	54	8.1	11	(.)
50	Morocco	860	2.4	8.2	28	45	29	41	4.6	548	3
51	Papua New Guinea	840	2.5	8.6	10	75	3	19	8.2	336	13
52	Tanzania	280	1.9	11.9	10	60	5	12	8.6	664	13
53	Tunisia	1,420	4.8	8.2	20	15	36	53	4.0	241	3
54	Uganda	220	−0.6	41.2	..	..	5	9	3.4	136	5
55	Viet Nam	100[s]	0.3[e]	..	..	..	15	19	3.3	242	3[f]
56	Zambia	600	0.0	8.4	25	..	23	44	6.5	231	7
57	Honduras	600	1.1	9.1	14	55	23	36	5.5	109	5
58	Nicaragua	860	0.6	14.2	21	19	41	54	5.0	170	7
59	Peru	1,170	1.0	34.3	49	..	46	66	3.5	233	1
60	South Africa	2,770	2.3	12.8	..	..	47	50	3.1	..	..
61	Botswana	1,010	7.9	11.6	40	55	2	28	15.1[f]	97	10
62	Brazil	2,220	5.1	42.1	..	..	46	68	3.9	235	0.1
63	Ecuador	1,180	4.3	14.1	40	65	34	45	4.6	59	0.6
64	El Salvador	650	1.5	10.8	20	32	38	41	3.4	167	6[i]

		GNP per capita (US $) 1981	GNP per capita average annual growth rate (%) 1960–1981	Rate of inflation (%) 1970–1981	% of population below absolute poverty level 1977–1981		% population urbanised		Annual growth rate of urban population (%) 1970–1981	ODA inflow (million US $) 1981	ODA as % of recipient GNP (million US $) 1981
					urban	rural	1960	1981			
65	Iraq	3,020[u]	5.3[h]	..	..	40[i]	43	72	5.3	9	(.)
66	Kenya	420	2.9	10.2	10	55	7	15	7.3	450	6
67	Dominican Rep.	1,260	3.3	9.1	45	43	30	52	5.3	105	1
68	Guatemala	1,140	2.6	10.4	21	25	33	39	3.9	75	0.9
69	Jordan	1,620	5.7[h]	..	14	17	43	57	4.7	833	21
70	Madagascar	330	−0.5	10.6	50	50	11	19	5.2	184	6
71	Zimbabwe	870	1.0	10.1	..	..	13	24	6.3	212	3
72	Colombia	1,380	3.2	22.4	34	..	48	64	2.6	102	0.3
73	Syrian Arab Rep.	1,570	3.8	12.0	..	..	37	49	4.6	563	4
	Middle infant mortality countries (IMR 26 to 50)	**1,770**	**3.1**	**15.9**			**35**	**51**	**3.4**	**3214T**	**0.5**
74	Mexico	2,250	3.8	19.1	..	47	51	67	4.2	100	0.1
75	Mongolia	780[a]	3.0[b]	..	..	..	36	51	4.0	..	..
76	Philippines	790	2.8	13.1	32	41	30	37	3.7	377	1
77	Thailand	770	4.6	10.0	15	34	13	15	3.4	407	1
78	United Arab Emirates	24,660	4.5[h]	..	..	..	40	73	16.6	(.)	(.)
79	Albania	840[a]	4.2[b]	..	..	..	31	37	3.4		..
80	Paraguay	1,630	3.5	12.4	19	50	36	40	3.3	55	1
81	Argentina	2,560	1.9	134.2	..	..	74	83	2.0	44	0.1
82	Guyana	720	1.8	9.9	..	..	25	23	1.6[f]	66	11
83	Sri Lanka	300	2.5	13.1	..	..	18	27	3.6	367	8
84	Chile	2,560	0.7	164.6	..	..	68	81	2.4	−7	(.)
85	China	300	5.0	..	..	..	18	21	3.4[f]	477*	0.2*
86	Lebanon	1,070[d]	3.1[e]	14.6	..	..	44	77	2.8	451	14[y]
87	Venezuela	4,220	2.4	12.5	..	..	67	84	4.2	14	(.)
88	Uruguay	2,820	1.6	60.2	..	..	80	84	0.6	8	0.1
89	Mauritius	1,270	2.1	15.0	12	12	33	53	3.6[f]	58	5
90	Korea, Dem. Rep.	1,130[a]	3.5[b]	..	..	..	40	60	4.3	..	..
91	Korea, Rep. of	1,700	6.9	19.8	18	11	28	56	4.6	331	0.5
92	Kuwait	20,900	−0.4	18.2	..	..	72	89	7.5	9	(.)
93	Trinidad and Tobago	5,670	2.9	18.7	..	39	22	22	1.4	−1	(.)
94	Yugoslavia	2,790	5.0	19.4	..	..	28	43	2.9	−15	(.)
95	Malaysia	1,840	4.3	7.4	13	38	25	30	3.3	142	0.5
96	Panama	1,910	3.1	7.6	21	30	41	55	3.6	39	1
97	Romania	2,540	8.2		..	..	32	50	2.8	..	..
98	Costa Rica	1,430	3.0	15.9	..	..	37	44	3.6	55	2
99	Jamaica	1,180	0.8	16.8	..	80	34	42	2.5	155	6
100	Portugal	2,520	4.8	17.0	..	..	23	31	2.4	82	0.3
101	USSR	4,550[u]	4.0[h]	..	..	..	49	63	1.8	..	..
	Low infant mortality countries (IMR 25 and less)	**9,110**	**3.6**	**10.0**			**62**	**76**	**1.5**	**833T**	
102	Hungary	2,100	5.0	2.9	..	..	40	54	1.4	..	..
103	Poland	3,900[u]	5.3[h]	..	..	..	48	57	1.7	..	..
104	Bulgaria	4,150[u]	5.6[h]	..	..	..	39	65	2.4	..	..
105	Cuba	1,410[a]	4.4[b]	..	..	..	55	66	1.9	14	0.1[c]
106	Greece	4,420	5.4	14.8	..	..	43	63	2.5	13	(.)
107	Czechoslovakia	5,820[u]	4.0[h]	..	..	..	47	64	1.9	..	..
108	Israel	5,160	3.6	43.5	..	..	77	89	3.1	772	4
109	Italy	6,960	3.6	15.7	..	..	59	70	1.1	..	..
110	Austria	10,210	4.0	6.1	..	..	50	55	0.6	..	..
111	Belgium	11,920	3.8	7.3	..	..	66	73	0.4	..	..
112	German Dem. Rep.	7,180[u]	4.7[h]	..	..	..	72	77	0.2	..	..
113	Germany, Fed. Rep.	13,450	3.2	5.0	..	..	77	85	0.5	..	..
114	New Zealand	7,700	1.5	12.9	..	..	76	85	1.9	..	..
115	USA	12,820	2.3	7.2	..	..	70	77	1.5	..	..
116	Ireland	5,230	3.1	14.2	..	..	46	58	2.5	..	..
117	Singapore	5,240	7.4	5.2	..	..	100	100	1.5	22	0.2
118	United Kingdom	9,110	2.1	14.4	..	..	86	91	0.3	..	..
119	Australia	11,080	2.5	11.5	..	..	81	89	2.0	..	..
120	Canada	11,400	3.3	9.3	..	..	69	76	1.2	..	..
121	France	12,190	3.8	9.9	..	..	62	78	1.4	..	..
122	Hong Kong	5,100	6.9	18.4	..	..	89	90	2.5	10	(.)
123	Spain	5,640	4.2	16.0	..	..	57	75	2.2	2	(.)
124	Denmark	13,120	2.6	10.0	..	..	74	85	0.8	..	..
125	Netherlands	11,790	3.1	7.6	..	..	80	76	0.6	..	..
126	Norway	14,060	3.5	8.8	..	..	32	53	2.7	..	..
127	Switzerland	17,430	1.9	4.8	..	..	51	59	1.0	..	..
128	Finland	10,680	3.6	12.0	..	..	38	63	2.4	..	..
129	Japan	10,080	6.3	7.4	..	..	62	79	2.0	..	..
130	Sweden	14,870	2.6	10.0	..	..	73	88	1.0	..	..

Footnotes to Tables

Table 1 Basic Indicators

[a] 1979
[b] 1977
[c] 1974
[d] 1972
[e] 1976
[f] 1975
[g] 1969–71
[h] 1978
[i] 1971–77
[j] 1973
[k] UNDP estimate
[l] 1969–71 rural only
[m] 1971–72
[n] 1980
[o] 1979–81
[p] East Bank only
[q] 1970–71
[r] 1970
[s] 1969–71 Beirut only
[t] 1979–81 Montevideo only
[u] Lowest 50%
[v] Highest 25%

Table 2 Nutrition Indicators

[a] 1981
[b] 1969
[c] 1981 (1974–76 = 100)
[d] Rural only
[e] 1974
[f] 1967
[g] 1972, rural only
[h] 1980
[j] 3 to 4 months
[k] 5 to 6 months
[l] 1971
[m] Fully breastfeeding

Table 3 Health Indicators

[a] Women aged 15–45
[b] 1975 total
[c] Total only
[d] 0 to 48 months
[e] 2 doses only
[f] 0 to 12 months
[g] 0 to 36 months
[h] 12 to 60 months
[i] DT only

Table 4 Education Indicators

[a] 1977
[b] 1972
[c] 1976
[d] 1975
[e] 1978
[f] 1973
[g] 1974
[h] East Bank only

Table 5 Demographic Indicators

[a] 1970–1980

Table 6 Economic Indicators

[a] 1979
[b] 1960–79
[c] 1979 GNP
[d] 1974
[e] 1960–74
[f] 1970–80
[g] 1974 GNP
[h] 1960–80
[i] 1980 GNP
[j] 1976
[k] 1970–78
[l] 1975
[m] 1975 rural only
[n] 1960–80
[o] 1960–76
[p] 1977
[q] 1960–77
[r] 1976 GNP
[s] UNDP estimate
[t] 1978 GNP
[u] 1980
[v] 1970–79
[w] Excludes data for Taiwan
[x] 1972–79
[y] 1975 GNP

THE STATE OF THE WORLD'S CHILDREN 1984

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£9.95 net in U.K. $19.95 U.S.A.

ISBN 0 19 828489 6

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